Changes in land utilisation along the line of the London and South Western Railway from Nine Elms to Basingstoke, 1838-1938.

Thesis

UNRESTRICTED

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CHAPTER 1

INTRODUCTION

The line of the area of investigation covers a route of nearly fifty miles: long enough, it is believed, to demonstrate definitively both urban and rural land use change over the period 1838 - 1938. It is intended to deviate away from the line as little as possible, thus preserving the distinction between a line and a transect. It is the belief that land use changes can be explained by considering evidence appropriate to a variety of academic disciplines, particularly Economic History and Historical Geography, which are both eclectic, and borrow sufficiently from other academic areas, in both content and methodology to use much of the available and relevant source material.

The period picture approach of the Historical Geographer is used and four periods, 1838: 1871: 1911: 1938 are chosen. 1838 is the date when the London and Southampton Railway was opened: the intention of the thesis here is to set the pre railway land use pattern. It is expected that 1871 will reveal a spatial pattern undisturbed by the consequences of the introduction of cheap railway fares; it is also the date of a census as well as being the time when new editions of the six inch Ordnance Survey maps were appearing. 1911 is a period when the railways met with stiff competition from other forms of transport such as the tramcar and the intention, at this time, is to focus especially on the northern part of the line where this form of competition was most pronounced. Finally 1938 represents the climax of interwar, low density, suburban development as well as being the centenary of the opening of the railway.

Each period study contains a consideration of the economic background to land use change, a study of contemporary land utilisation and an assessment of the impact of the railway on land use change which has occurred since the preceeding period. Especial emphasis is placed on legal, technological and economic change and locations along the line

where stations have been built are given special consideration.

A variety of primary source material is used. Censuses were taken throughout the period of study and these are utilised at the county rather than at the ward level because, unfortunately, administrative changes affecting the size of settlements and changes in the terms of reference in such vital areas as housing, have made comparative assessments, at the ward level, invalid. Those Parliamentary Papers germane to land use change, at both the national and local level, have been consulted, as have railway company records. Unfortunately some of the records of the London and South Western Railway were destroyed in the 1939 - 1945 war, but contemporary timetables remain and these are used to illustrate the growth of commuter rail traffic. It is only after 1871 that the six inch Ordnance Survey maps are of assistance in this thesis and specimen photocopies are located in a separate portfolio and are listed in Appendix (3). For earlier periods Carey's map of Greater London (1830) is consulted. The first Land Utilisation Map (1931) is of assistance in disentangling land utilisation during the later period of study and a line map, intended as a reference document, is available at the end of the thesis.

The 'General Views' of the Board of Agriculture for both Hampshire and Surrey, as well as the parish summaries in the Board of Trade's 'Agricultural Statistics' (which date from 1866) form a subsequent, accurate agricultural base and for earlier periods use is made of the statistically unreliable 'Crop Returns'. Local newspapers, such as the 'Hampshire Advertiser' and 'Surrey Comet' together with contemporary property guides, such as those published by the 'Homeland Association' contribute partly to the study of the development of new housing areas. These are reinforced by reference to the major contemporary building and architectural journals. 'The Architect', 'The Builder' and 'Building News' were published throughout the period of study and provide both local and, occasionally wider, example.

The most useful secondary source material is provided by the 'Victoria County Histories' of both Hampshire and Surrey. Both emerge early, being published at the beginning of this century and lack, therefore, some more modern and relevant comment. Occasionally local histories are useful, for instance F.J. Baigent and J.E. Millard: History of the Ancient Town and Manor of Basingstoke (1899) and railway guides such as Meason (1864) provide a guide to the line.

Tertiary sources in both agricultural and social history are consulted and are reinforced by the use of H.C. Darby: A New Historical Geography of England (1973) as well as by many of the published works of Professor M.E.A. Bowley which deal with the British building industry. Additionally, specific material commenting on both railway operation and railway technology is used whenever this is helpful in explaining land use change. This material covers a wide time span and commences with D.. Lardner: Railway Economy (1850).

Field work has been undertaken at select locations, both in England and abroad, and is used to confirm relict evidence which emerges with the consideration of other material. An especial emphasis is placed on sites near railway stations. This work is assisted by detailed local studies and especially by A.A. Jackson: Semi Detached London (1973). Complicated, local maps are avoided.

The great majority of the academic research literature concerned with the growth of London since 1838 is directed to both the content and methodology of a single discipline. The late Professor Dyos dealt with 'The Suburban Development of Greater London South of the Thames' (1952)[1] from the viewpoint of a social and economic historian, taking, however, a very wide perspective and venturing into other disciplines whenever this seemed to be desirable. Others, such as Jahn (1971)[2] and Pepper (1965)[3] continued with the same eclectic approach but at the micro, rather than the macro, spatial level. In Geography much of the work is restricted to the micro spatial level and concentrates on

spatial changes over time within very restricted areas and is illustrated by the work of Waugh (1968)[4] and Carr (1970)[5]. Others such as Binford (1976)[6] have used the interdisciplinary approach to investigate a specific problem.

The purpose of this thesis is, therefore, to direct an interdisciplinary macro scale approach to the topic of land use change, along a line, over a hundred year span, by means of period pictures and, in conclusion, to make limited comparison with first other contemporary railways radiating from London. Second to see whether a very general consideration of contemporary railway building radiating from Berlin, Boston and Paris reveals additional points relevant to land use change. It is hoped to demonstrate that this approach assists into the investigation of land use change along the line of the London and South Western Railway from Nine Elms to Basingstoke within the period 1838 - 1938[7].

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4. M. Waugh — The Suburban Development of North West Kent. 1861 - 1961. Unpublished Ph. D. thesis. University of London 1968.

5. M. C. Carr — The Growth and Characteristics of a Metropolitan Suburb (Bexley) 1880 - 1963. Unpublished Ph. D. thesis. University of London 1970.

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7. The section of railway line studied in this thesis was called initially the Southampton and London Railway (1834). By 1837 it was known as the London and Southampton Railway and by 1839 formed part of the London and South Western Railway. After 1921 the London and South Western became part of the Southern Railway.

CHAPTER 2

LEGAL, GOVERNMENTAL AND TECHNOLOGICAL CONSTRAINTS AS ELEMENTS IN LAND USE CHANGE

Walter Isard (1942) noted first that revolutionary innovations in transport technology had been accompanied by spurts in building activity as well as by radical changes in land utilisation[1]. The area of investigation, the United States of America, was one of an economically free land market unhampered by influential legal constraint as well as being largely uncomplicated by elitist land owners such as the Church of England or peers of the realm. Such owners could be highly influential in effecting changes in land use or precluding these potential changes altogether. In Great Britain, substantial landowners dominated the periphery of large cities in the early nineteenth century and exerted an influence on the direction of railway routes as well as on building style and functions. The railways themselves were subjected to very stringent governmental control as were potential town extensions and substantial alterations to existing cities[2].

Parliamentary Constraint

In Great Britain, railway companies, dating from the eighteen twenties, were the first large public companies to be formed since 1720 when an embargo had been enforced by Parliament after the collapse of the South Sea Company. Railway companies required substantial capital (The Southampton, London and Branch Railway and Dock Company, for instance, was capitalised at £1.5m)[3] and, in order to raise this, companies were granted certain privileges by Parliament. First the ability to raise capital from more than six people, second the ability to acquire property by compulsory purchase. The former was an important concession and assisted the railways to raise the substantial sums they required. Further, the Companies Act of 1844 allowed businessmen who had previously been either in partnerships or unincorporated associations the benefits of incorporation[4]. This helped especially the various

suppliers of materials to the railway companies and assisted in their enlargement to an appropriate size. By 1856 there was general provision for limited liability and further concessions in 1862 lifted entirely the inhibitions on large firms contemplating mass production[5]. In return for these concessions, the railway companies were subjected to rigorous examinations by Parliamentary Committees and various groups (especially elitist groups) had the opportunity of deviating the proposed line or, in some cases, denying it altogether. Additionally the potential economic viability of each railways was rigorously assessed for fear of financial failure. The combination of the pressures of the interest groups and the Parliamentary quest for economic viability meant that the early railways reached the periphery of cities with the minimum of disturbance to property and approached the cities through often sparsely peopled territory, avoiding large towns along their routes. It was advantageous too, to penetrate a built up area through an area of homogeneous land holding, because it was easier, as well as cheaper, to acquire permission to build from as few landowners as possible. Kellett (1969) commented on the economic advantages of such a situation, particularly in regard to the cost and speed of railway building[6].

Parliamentary constraint did not end with railway building and was extended to railway operation and such items as speed, designation of accommodation and fares were, at various times, under Parliamentary supervision and, after early accidents, the concern for safety inhibited the speed of trains. In all, and particularly during the early period of railways, the government exercised a substantial measure of control upon the railway companies potential ability to make impact on land use changes, especially on the periphery of large cities, as Kellett has demonstrated.

Reinforcing this Parliamentary inhibition were a number of organisational factors in London's government which restricted urban extension,

improvement and land use change. Gibbon and Bell (1939) remarked on 'Administrative Chaos' in London before the Metropolis Management Acts of 1836 - 9[7]. Much of this chaos was manifest outside the limits of the 'Bills of Mortality', (The Registrar General's area in which the population had to be warned of the coming of the plague) - but even within the 'Bills' there was a strong element of administrative confusion in 1838[8]. On the periphery of London, outside the 'Bills' administrative confusion was indescribable: a large number of agencies had widely overlapping powers and rarely consulted each other. Vestries had powers over sanitary nuisances as well as some roads: Justices were responsible for bridges and some other roads. Frequently, however, an important road was under sectional control and differing policies were implemented. The Metropolitan Commissioners were responsible for sewers, paving, lighting and surveying buildings. Gibbon and Bell estimated that before the Metropolis Management Acts, these various bodies consisted of about 10,500 members, who were chiefly unelected, and seldom met together and never acted in unison. They had a remarkable facility for inactivity as well as for running into debt. In St. Pancras, for instance, there were sixteen paving board prior to 1839, £135,000 had been spent, yet there was no paving[9]. These various bodies too had little initiative to improve property, as the 1832 Reform Act allowed freeholders, whose property was rated at £10 or above, a voting qualification which might have ended the tenure of these bodies.

As a result of the Metropolis Management Acts a Board of Works was introduced within the 'Bills' area and the affairs of inner London began to be organised in a way which helped urban renewal, urban expansion and, therefore, land use change. The government of inner London, however, remained indifferent to appalling housing except when it became a health hazard and the Board (as well as the district) authorities surrounding London) was given a broad range of duties under

the Nuisances Removal Act of 1855[10]. This helped substantially with the establishment of paving, the cleaning of streets, certain new building and the general outward movement of population which was assisted greatly by the building of a sewer system which, by law, had to preceed further building. There seems little doubt, however, that the legacy of administrative chaos invoked a degree of subsequent introspection and internal consolidation which certainly inhibited urban expansion. This is reflected in the subsequent cautious operation of the Metropolis Management Acts as well as the Local Government Act of 1888 when the London County Council emerged, operating overran extended area including parts of the home counties which had, previously, belonged to Essex, Kent, Middlesex as well as Surrey.[11] And at the local level, the Local Government Board Provision Orders Confirmation Acts of the last quarter of the nineteenth century inhibited the spatial expansion of Kingston, Wimbledon, Woking and Basingstoke, in that they preserved houses occupied by the 'Labouring classes' on the periphery of these places, believing that if these properties were demolished, certain desirable categories of working people might be displaced, whilst, at the same time requiring that any new property should conform to the standards laid down in the 1875 Sanitary Act[12].

The impact of administrative confusion on land utilisation has been noted by Gauldie (1974). In the period 1830 - 1840 every scrap of land in the inner city was built over to make money particularly from house letting. Roads, especially, were narrow and limited to save money and to increase the area available for accommodation[13]. Additionally, government policy in the nineteenth century was designed to abolish slum property without replacing it. Thus the Public Health Act of 1848, for instance, could demolish property when the death rate in an area rose above 23 per 1,000. The Artizans and Labourers Dwelling Act of 1868 enabled local authorities to demolish or improve unsuitable

housing, and the Cross Act of 1875 allowed the same authorities to clear out an insanitary area and redevelop it. Gauldie and others have demonstrated that the displaced mere dispersed and regrouped in other locations adding substantially to overcrowding(14).

The provision of suitable housing for working people, which could have contributed to the spread of London, was delayed by official indifference to their plight up to 1919. In general, nineteenth century attempts at providing new housing for workers were restricted to the efforts made by philanthropic bodies whose activities were tempered by economic reality. Thus the Society for Improving the Conditions of the Labouring Classes, the Metropolitan Association and the Peabody Trust erected buildings within the existing London County Council limits, and it was left to local authorities under the provisions of the 1919 Housing and Town Planning Act (and other interwar housing acts) to lower population densities in the inner city substantially and to spread the city out.

Technological Constraint

At their initiation railways had a limited potential for dispersing population. Early locomotives, with their large diameter single driving wheel, had but little ability to haul a large load or to accelerate quickly(15). Both of these were drawbacks for suburban work. These deficiencies might have been subdued by the introduction of bogies, which were certainly known about at the time. Bogies would, however, have expanded locomotive length and precluded the use of turntables which were already installed(16). It was considered essential that locomotives should be driven front forwards particularly since the early locomotives provided little protection for the operating staff(17). The frequency of early trains was limited by both signalling methods and design. For the first twenty years of the London and South Western signalling was of the fixed variety which was operated by the traditional

time lapse method[18]. Thus a certain time elapsed before another train was allowed on a particular stretch of line. By mid century this time had been reduced by the adoption of the electric telegraph which enhanced communication between signalling stations[19]. Additionally the adoption of distant signals made greater frequencies safer. The London and South Western was one of the pioneers of distant signalling introducing them at Kingston Junction as early as 1848[20]. Generally railway companies improved the frequency of their services with caution, especially after a series of signalling errors had resulted in notorious accidents (such as the London and South Western collision at Egham in 1864)[21] which met with sharp comment from the Parliamentary investigators and adverse publicity in the press.

By mid century there were various other technological developments which combined with improvements in signalling and communication to raise passenger carrying potential. The replacement of coke by coal as a locomotive fuel was pioneered by the London and South Western under their chief engineer Beattie[22]. Not only was coal a more powerful fuel, but superior locomotive design made better use of it. By 1850 the bogie was in general use and assisted in the emergence of larger, more powerful locomotives, which by the 1860's were supported on steel, rather than wrought iron rails. Steel rails could endure higher speeds, greater weights and had a much longer life than the iron ones. By 1860 brakes were common on all carriages and not exclusively on first class ones only, and the railway companies felt inclined to allow higher speeds as well as greater frequencies of trains. Lastly, on long distance runs the general introduction of tenders obviated the need for frequent coaling stops[23].

It was a combination of passenger capacity, efficient signalling, acceleration and braking which was important in sustaining frequent, reliable suburban services, especially in the rush hours. This combination

was achieved by the London and South Western by 1915 when the company adopted the third rail electric system on some suburban services. In the next decade this system spread rapidly throughout their suburban system[24]. The company was later than others in adopting colour light signalling which was introduced on the main Waterloo to Basingstoke line in 1938. Automatic signals and even automatic train control had been used by the Great Western Railway in the early years of the twentieth century, but were not then by other carriers[25]. Other companies, fearing the new competition from electric locomotives as suburban carriers, developed steam locomotives which could rival electric stock in acceleration. Those of the Great Eastern Railway could accelerate from 0 to 30 m.p.h. in thirty seconds.[26]

Ashworth (1960) remarked that, not only was electricity of great use to the railway companies, it opened up the possibility of industrial dispersal and it was no longer necessary for companies using substantial quantities of fuel to be sited near a railway line.[27]

Legal and Financial Constraints

The ability to build houses and thus to expand London and change existing land use, was limited, in part, by the ability to raise capital for what amounted to largely speculative building[28]. By the mid nineteenth century capital for speculative building could be raised in three ways. Firstly from Insurance Companies who, in time, became increasingly discriminating and restrictive, learning lessons both from business failures and inadequate returns. Second from Building Societies, which prior to the Building Societies Act of 1874 were 'Temporary' societies, providing a means of self help and self finance for the lower end of the property market[29]. Often developments accomplished in this way were small. Then, as now, the ability of Building Societies to participate in the housing market was tempered by their competitiveness vis a vis other prevailing interest rates. The third source of capital was from local solicitors who advanced funds, using their own commercial judgement

and local knowledge for small scale property development, especially, as Dyos (1968) has noted in South and South West London[30]. Dyos believed that the amount of property financed by solicitors was quite substantial but this is an area requiring further investigation.

Because railways often helped land prices to rise, landowners were generally disinclined to sell land outright, preferring to grant leases. These normally were never less than sixty years, occasionally for nine hundred and ninety nine, but traditionally for ninety nine - the short London building lease[31]. Leases were often accompanied by restrictive covenants, resulting in a uniformity of texture of building, and ground landlords were thus able to keep control of the sites as well as benefitting from the rise in land prices throughout the period. Both property construction and railway building required supplies of building materials on a scale and in amounts never previously attempted. Sekon (1896) estimated that 80m. bricks were used in the construction of Waterloo station alone[32]. Important technological innovations assisted in making these materials both plentiful and cheap. At the beginning of the nineteenth century brick making was small scale, unmechanised and local: the brickworks of greater London were traditionally backward[33]. By the end of the nineteenth century brickmaking was concentrated in large local areas of mass production: real manufacturing costs had declined and railways had alleviated the high costs of transport[34]. Throughout the country small local brickworks remained either as specialist units or because they were in situated areas of inferior communications. By the end of the nineteenth century the brickworks surrounding London had all but disappeared releasing the land for other uses, and production for the London market was concentrated at Bedford and Peterborough (which exploited the self firing Oxford Clay), where such technological advances as the pug mill and wire cutter (both introduced in the 1830's) and the mechanical pressing machine of mid century enhanced efficiency[35]. Additionally the industry as a whole was assisted by the repeal of the Brick Act in 1849

which meant the removal of the customs duty on bricks.

Nevertheless, the fact that bricks were not produced locally in large quantities, that timber had to be imported and transported from the London docks, that cement had to travel from either the North or South Downs or the River Medway, meant that, on occasion, building activity did not progress either as fast or as cheaply as developers had either hoped for or anticipated. Bowley (1960) nonetheless maintained that innovations in brick making in the nineteenth century were price rise preventing allowing for an expanded market.(36)

A substantial constraint on the physical sprawl of London was the late legal enforcement of sufficiently short working hours to allow a divorce of workplace and residence. Certain activities, such as work in the London docks, remained on a casual basis until the twentieth century making separation of residence and workplace very difficult indeed. Ashworth (1960) remarked that the irregularity of employment diminished by 1900 and, at the same date, the fifty hour week was common in certain trades(37). But in many occupations the hours worked were excessively long. Shop assistants, for instance, endured a seventy four hour working week up to 1914, whilst in 1911 a strike of London catering workers took place for a demand of a seventy five hour working week(38). Such hours, general amongst the working classes until 1914, were obviously unhelpful to population dispersal and often made it impossible or impracticable whether or not workers had sufficient money to pay railway fares or whether services were available. Olsen (1976) has demonstrated that even if working people had the ability to move out there was, in some areas, a filtering process by selection. Only those believed to be respectable, and thus likely to improve the tone of the neighbourhood, were considered as candidates for renting property in some areas. Illness and age, as well as economic and social factors precluded settlement for some in elitist suburban areas, and these factors continued as a restraint until 1939 in some places(39). Clapham (1952) noted the general reduction in

working hours of between 2.5% and 5% during the period 1886 - 1914, and these figures help to strengthen the view that marginal commuting at a distance was a possibility, a prospect reinforced by the general rise in wage level during this period.(40)

Agricultural Technology as a Spatial Constraint

Initially, agriculture surrounding London, was constrained by both transport limitation as well as by an infant preservation technology, and time in transit, was a crucial factor in terms of the deterioration of the agricultural product. An illustration of this is the extreme case of cow houses, which existed in the centre, rather than the periphery, of the city, at the beginning of the nineteenth century(41). There they remained until transport, technology and economic circumstance, combined to bring fresh milk swiftly into the centre of the city. At the same time, meat was driven into London on the hoof, the animals losing weight and deteriorating generally on the journey. These factors, in combination with the indirect costs of finding fodder and water en route, were reflected in the high meat prices experienced in the city. Initially too, vegetable growing and market gardens formed a discontinuous ring around the city, showing a marked preference for the warm alluvial soils, but unable to move further away than those particular areas because of deterioration caused by deficiencies in both preservation and transport. By 1906 Pratt noted that 'Refrigeration processes nullified climate and steam had nullified distance and that vast expanses of virgin soils had been opened up overseas'(42). Change was accelerated not only by developments in transport and preservation technology, however. Large urban outbreaks of cattle plague (rinderpest) accelerated the removal of cow houses from the inner city aided by substantial Parliamentary legislation, (The Cattle Diseases Prevention Act 1866), and there is evidence that rising land values put cow house owners under commercial pressure to abandon their activities(43). In 1868, however, specially designed milk churns were used to bring milk to the centre of Paris by train from the surrounding

countryside, and this method was soon adopted by English carriers, especially the Great Western Railway[44]. In 1906 Pratt recorded that the average distance that milk was carried to London was 80 miles, and that preferential freight rates were being charged to encourage this diffusion[45]. The normal rate was 1d. per 100 gallon miles, and there is evidence that railway companies failed to anticipate the wear and tear caused by heavy churns on station facilities. Developments in preservation and transport technology helped in the diffusion of milk production to more distant areas. They removed the same constraints which had sited large scale market gardening on the periphery of the city. By the end of the nineteenth century market gardening was not only increasing its output to keep pace with demand, but regrouping so as to be sited at climatically suitable locations. Worthing, for instance, had made complicated and successful arrangements with the London Brighton and South Coast Railway, for the transport of fruit, vegetables and flowers to Victoria, and the Worthing region as a whole had responded to advances in greenhouse technology[46]. In particular, steam engines had been used for pumping, providing the circulating power for the hot water based central heating system of the greenhouses. In West Middlesex the railways diverted traffic from the roads, and vegetables, fruit and flowers were grown on the alluvial soils at a distance of about twenty miles from London. Pratt remarked that it was easy to transport these items into London by horse and cart as passenger and commercial traffic had moved to the railways[47]. But the early impact of the railways as conveyers of food was experienced by the meat trade. By 1850, in every county the direction in the trade was shifting towards towns well served by the railways. And, at the same date, the drovers who fattened meat on the edge of cities had all but disappeared. From the 1860's advances in preservation techniques allowed dead meat to enter the capital in ever increasing quantities, and the range of prospective suppliers had increased too, aided by the refrigeration techniques in the 1870's which applied to shipping as well as railways.

British suppliers faced world wide competition in the London markets, which, at times, they failed to resist, and land was released for other uses.(48)

At the beginning of the nineteenth century the difficulties experienced by farmers were not merely confined to moving products to the London markets, they experienced a variety of other operational difficulties as well. The acquisition of manure and fertilizer for instance, was possible only when water communication (river and canal) was good and when it provided access to a suitable source of materials. The Agricultural Revolution itself had provided the technology to deal with grubbing, ploughing and digging heavy land, but such machinery as there was was horse drawn and relatively labour intensive(49). The introduction of mobile steam engines partially removed these constraints as well as enhancing the existing technology. To an extent, the range and efficacy of the steam engine depended on the railway. It had a high consumption of coal (six to seven hundredweights per day) and the steam engine was, essentially, heavy, requiring good metalled roads on which to operate(50). Materials for these were normally supplied by the railways. Where such roads were not available, steam engines could get trapped in the mud if the weather was bad, and contractors were loath to lease their engines out in such situations(51). Steam engines contributed to the rise of output on farms, increased agricultural efficiency and released man power, which, certainly by the middle of the nineteenth century, was tending to migrate towards the large cities.

During the hundred year period of this study, therefore, constraint of potential land use change, imposed by a variety of circumstances (which often reacted in combination) was most marked as well as being essentially complicated. Initially, there was an unintentional combination of administrative confusion, technological limitation as well as a social organisation which allowed for concentrations of population within large cities and pronounced pockets of specialised land use on the city periphery.

Later the confusion was replaced by an administrative control which impinged upon land utilisation, whilst simultaneously, technological advances, in building methods as well as in transport and farming, gave opportunities for agriculture, residence and factories to disperse and relocate, either if they wished or if they were susceptible to economic forces. In the case of transport and building these forces were tempered further by additional powerful constraints partly imposed by Parliamentary legislation and partly by the money providing agencies.

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CHAPTER 3

LAND USE ALONG THE LINE IN 1838

The Economic Background to the 1838 Land Use Pattern

Deane and Cole (1962) mention a number of contemporary authors who commented on the economic state of Great Britain during the first forty years of the nineteenth century. These comments are especially valuable because, until the late eighteen thirties, national income data is deficient[1]. In the period up to 1841, all agree, however, in the general decline of agriculture as a proportion of the national product, but this is a decline which has delayed by the Napoleonic wars when agricultural output was sustained by them. And, importantly, this decline in agriculture is revealed in the context of outstanding economic growth in other activities, especially manufacturing mining building, and also in housing. All these activities spurted after the delays the wars had brought about.

	Percentages of National Product		
	Agriculture	Manufacturing/Mining/Building	Housing
1801	32.5	23.4	5.3
1811	35.7	20.8	5.7
1821	26.1	31.9	6.2
1831	23.4	34.4	6.5
1841	22.1	34.4	8.2

(2)

Hobsbawn (1968) has commented that until the end of the nineteenth century transport costs and technology did not permit the bulk of the nation to be fed by overseas food imports[3], so the early part of the nineteenth century is possibly a period of spatial conflict, with land required to feed the growing industrial population but, at the same time, manufacturing, mining and building claiming more land for their activities, particularly as sections of the population grew more affluent. It was the spread of affluent (and space demanding) sections of the London population who were making incursions into agricultural land in the area of study during the early period of the nineteenth century.

The reaction of agriculture to this combination of circumstances was, as Ernle (1922) stated, one of exceptional progress. He mentioned the new facilities of transport which were seized eagerly by some farmers, particularly those provided by river cuts and canals, and the reclamation of land previously considered to be unsuitable for agriculture, as well as the enclosure of some of the open fields. He emphasised, especially, the injection of capital into farming, which was revealed by new buildings, improved stock and terrain improvement.(4)

In Surrey and Hampshire enclosure had accelerated in the late eighteenth century. Between 1794 and 1805, in Surrey, 2735 acres of common field had been enclosed(5) and in Hampshire, during the period 1785 - 1809, 40,000 acres fell to enclosure; arable land being particularly susceptible(6). Yet in the area of the south western extremity of the transect, the fertile loam and chalk around Basingstoke was entirely open fields in 1838(7). Although the enclosure rate in Surrey had accelerated it was not fast enough for some. Stevenson (1809) maintained that Surrey was dilatory, falling behind most other counties both in the amount and rate of enclosure(8). Vancouver (1810) was uncertain of both the amount and the rate of enclosure in Hampshire but was critical of the progress being made there.(9)

New forms of transport and certainly made an impact on the agriculture of both counties. Horner (1767) had identified the components of transport deficiency. First because of the defective condition of roads the price of corn differed greatly in various locations and he added that there could be a glut in one place and a deficiency in another with no means of equalising matters. Second slow progress was made in the improvement of agriculture in some places really because of the weak diffusion of new ideas as well as the partial inability of farmers to implement them. Farmers, for instance, would know about manuring but found that, in certain localities, the price of manure was prohibitive because of

inferior transport. Curtler (1909) cited the resistence offered to better roads by the large estate owners during the early nineteenth century because they feared change on their lands[11]. Stevenson remarked on the poor state of the Surrey turnpikes which lacked, amongst other things, proper foundations, and were thus unable to support very heavy loads[12]. Vancouver, however, maintained that the Hampshire roads were some of the best in the country and he commented on the useful contribution made by the Basingstoke canal which extended into Surrey[13]. The prospectus for the canal had promised a wider spatial market for those who lived alongside it. The Hampshire coast, the Western counties, the Channel Islands, as well as the south coast, were believed to be within its sphere of influence[14]. The initial reports of the canal company confirm that this had been achieved and that farmers were aware of larger markets in spatial terms.[15]

There is considerable evidence that financial overextension, arising when farmers took on very large mortgages during the Napoleonic wars, delayed capital expenditure and investment in the eighteen twenties and thirties[16]. After the wars wheat prices fell, having risen from 58/10d a quarter in 1803 to 126/6d a quarter in 1812 and then falling to 65/7d in 1815[17], a situation which meant that mortgage repayment was often very difficult[18]. Interest groups attempted to protect indigenous agricultural enterprise and, in 1815, the Corn Laws were passed prohibiting the import of foreign grain until the price of home produced grain reached 80/- per quarter[19]. If the Corn Laws assisted, natural catastrophes prolonged the farmers' plight in some places. Instances included the long wet summer of 1816, the sustained drought of 1818, and sheep rot which ranged over the nation in 1830. In the wake of bankruptcies farms reverted to thistles and weeds[20]. National concern was examplified by the Committee on Agricultural Distress which sat in 1819. But by 1838, the Tithe Commutation Act gave some financial relief to farmers and new techniques in farm mechanisation had been introduced, including the

first steam ploughs, giving, perhaps, advanced warning of the reduction in farm manpower requirements which was to be a feature of the hundred year period of this study.

Population had increased dramatically in the early years of the nineteenth century especially in the towns and cities. (see table 1). A great deal of city growth was the result of migration from the countryside and the ease of mobility is reflected in changes in the Settlement Laws which were accomplished just after the opening of the Southampton and London Railway. Up to 1846 the 1662 Settlement Law made each township responsible for its own poor even when the poor had moved away, but by 1843 litigation between townships had become costly, and the municipal workhouse had tended to replace 'Outdoor Relief'. (Payments made to the destitute poor, wherever they were to be found, as a matter of simple expediency[21].) By 1846 Graham's Act made those migrants who had been resident five years in a new location wholly irremovable. The easing of the situation, in combination with the strong measure of control exerted in closed townships (those settlements which did not welcome newcomers and were normally under the control of large landowners) particularly in terms of cottage building, rates of occupancy etc., must have been a considerable inducement to move to London from the areas not too far away[22]. The high incidence of parkland near the potential Southampton and London Railway meant that the 'closed' situation was especially important in Surrey[23], whilst in Hampshire the problems of poor relief caused considerable unrest[24]. Wages, in 1843 for instance, were still too low for labourers to bring up their families even when these were eeked out by grants of cloth or shoes from the parish assistance, which was denied to emigrants when work was scarce here. In Hampshire this situation culminated in a series of agricultural riots which included the burning of hayricks and the wrecking of agricultural machinery. For many farmworkers the cure for low wages was found in moving away from the

TABLE 1

Population Increase from 1801 to 1831

	1801	1811	1821	1831
England & Wales	8.89m.	10.16m. (+ 14.2%)	12.00m. (+18.1%)	13.90m. (+15.8%)
Surrey (excluding present (1979) G.L.C. area)	.11m.	.12m. (+ 14.1%)	.14m. (+14.8%)	.16m. (+12.9%)
Hampshire (including Isle of Wight)	.22m.	.25m. (+ 12.3%)	.28m. (+15.00%)	.31m. (+10.9%)
London (1979 G.L.C. area)	.96m.	1.14m. (+ 18.7%)	1.38m. (+21.1%)	1.66m. (+20.00%)

Source: B.R. Mitchell and P. Deane. 'Abstract of British Historical Statistics'. Cambridge University Press. 1971. p. 20.

locality where these occurred.[25]

In the context of population movement it is hardly surprising that important textural differences could be noted in 1838 along the route to be taken by the Southampton and London Railway. Moore (1948) described London, at the beginning of the nineteenth century as small, compact and very congested[26]. She noted that between 1820 and 1830 there existed terrible slums and numerous one roomed tenements in the central area. Changes were occurring, however, and, at this time, the outer suburbs began to expand as they became filled with wage earners and small tradespeople. Wealthy tradespeople moved to more select areas on the outskirts of the city (such as Clapham Common) abandoning a residence over their place of business in the central parts of the city. Moore reveals that a spell of accelerated business activity followed the Napoleonic wars and hastened this migration[27]. Thus the northern part of the line had experienced rapid population growth since 1801, especially within the 'Bills of Mortality' and, using percentage population changes alone, this could be said to represent a distinct zone. (See Tables 1 & 2). The 1851 census showed the extent of the drift to London, in which transport innovation as well as the changing settlement laws, had played a part. (See Table 3). There seems little doubt that many aged over twenty in 1851,could have moved into London at an earlier period.

Although there had been numerous complaints in the early eighteenth of the transport system in the area of study, considerable improvements had been made since the middle of that century. Nationally, in 1750, some four hundred turnpike trusts were in existence; by 1790 a further 1,600 had been built. Another 2450 were constructed between 1790 and 1840[28]. A product of this later period was the Portsmouth Road, an important turnpike and partially adjacent to the line of the proposed Southampton and London Railway[29]. Adjacent also to the proposed line,

TABLE 2

Population Increase from 1801 to 1831 (Smaller Settlements)

	Distance from London	1801	1811	1821	1831
Clapham	2¾ miles	3864	5083(+31%)	7151(+40%)	9958(+39%)
Sites away from Line of Study (for comparison)					
(Lambeth)	2	27939	41644(+49.5%)	57638(+38.4%)	87856(+52.4%)
(Camberwell)	4	7059	11309(+60.2%)	17876(+58.1%)	28231(+57.9%)
Wandsworth	4¾	4445	5644(+26.9%)	6702(+18.7%)	6879(+2.6%)
Wimbledon	7¼	1591	1914(+20%)	2195(+14%)	2195(-)
Kingston	12	4438	4999(+12%)	6091(+22%)	7257(+19%)
Malden	9¾	210	220(+5%)	250(+.3%)	209(-19%)
Walton	17	1476	1804(+22.2%)	1891(+4.8%)	2035(+7.6%)
Weybridge	19	747	918(+22.8%)	897(-2.3%)	930(+3.6%)
Woking	24½	1340	1578(+17.0%)	1810(+15%)	1975(+8.0%)
Winchfield	36	238	216(-10.1%)	226(+4.6%)	227(+0.4%)
Basingstoke	47¾	2589	2656(+2.9%)	3165(+19.4%)	3581(+13.3%)

Source: Report on the 1831 Census. H.M.S.O. 1834.

Distances Bradshaws Railway Guide.

TABLE 3

Migration to London recorded in the 1851 Census

	Under 20 years	Over 20 years	Total	Percentage of 1851 population of county of origin
Surrey (ex metropolitan area)	9235	29346	38351	19.06
Hampshire	5172	29302	34474	8.58
Middlesex (ex metropolitan area)	8922	22504	31426	20.80
Kent (ex metropolitan area)	12845	54942	67782	13.90
Highest English Counties outside Metropolitan area				
Devonshire	5529	31840	37369	6.50
Somerset	4785	27691	32476	7.12

Source: 1851 Census Report. H.M.S.O. London 1852

between Weybridge and Basingstoke, the Basingstoke Canal had been in operation since 1796 and was linked to the Wey navigation which had been completed in 1760[30]. The intention of the Basingstoke Canal promoters was to send goods and stores to and from the southern coasts of Hampshire and the Western counties as well as the Isles of Wight, Guernsey and Jersey. The catchment and service areas of settlements along the route of the canal would, therefore, be enlarged substantially. The promoters believed that the goods moved would include a variety of timbers, coal, grains, vegetables and flour. Waggons would move from Winchester, Southampton, Romsey, Sarum (Salisbury) and Andover to link up with the canal. They believed that freight rates would be cut and that the general freight rate from Basingstoke to London would be 12/- per ton[31]. A contemporary and unidentified pamphlet printed in Farnham mentioned the great reduction in the price of coals there. Jackman (1966)[32] gives illustration of how the canal did indeed cut freight rates:-

Goods by Land

1774. Southampton to London 31/6d per cwt. (By road)
1786. Basingstoke to London 25/- per cwt. (By road)

1796. Weybridge to London 8/- per ton. (By water) [33]

By 1840 both the coach and waggon services in the area of study were extensive particularly in the northern section. Clapham had an hourly coach service to London. Kingston (on the main Portsmouth Road) had twenty-six coaches daily in 1836, with destinations ranging from Littlehampton and Chichester to Portsmouth and Southampton[34]. Basingstoke's coach services consisted of at least twelve daily serving Salisbury, Exeter, Taunton and Bristol[35]. Both Basingstoke and Kingston had coach connections with London. Extensive though these services were, coach fares were high and mobility enjoyed only by the quite well to do.

Waggon services were less extensively advertised. Hate mentioned the 'considerable' service from Basingstoke and Cooke that services were

available from Clapham, Kingston, and Wimbledon[36]. Baigent and Millard (1889) made similar observations regarding Basingstoke[37]. It is only when waggon services did not exist that comment was invoked. In parts of Surrey and Hampshire, away from the turnpike roads and navigable rivers and the canals, services did not always exist and many places must have been remote in 1831. Stevenson used the existence of woodland, the lack of clearance and the feeble cultivation of some districts, as well as the fact that these areas lacked access to coal, as indicators of poor transport at the beginning of the nineteenth century. Since enclosure often came late in Surrey the concomitant road improvements were often delayed as well[38]. Thus, in 1838, it is demonstrable that transport had played already a significant part in establishing the land use pattern, particularly in terms of the economic activities it had encouraged or, by the absence of suitable transport forms, precluded.

The Pre Railway Land Use Pattern

It is possible to distinguish three zones in the pre railway land use pattern. (See Diagram 1). The first from Nine Elms to Clapham, had intimate contact with London, both in terms of the movement of people as well as of foodstuffs and commodities: the second, between Clapham and Wimbledon (although the boundary here was less distinct) was developing the same characteristics but with an uneven emphasis and texture. The third beyond Wimbledon was where these characteristics were either feebly developed or absent altogether.

Suburban development was beginning to make an impact on the agriculture of the first zone. Stevenson noted that the garden grounds very near London were, every year, becoming more scarce as the demand for building land increased, and he remarked that the rent of such land for gardens bore a much higher price than land equally good at a greater distance[39]. Between three and four miles from the metropolis rents were high, (as much as £11 per acre, but generally £6 - £10); the

DIAGRAM 1

The Pre Railway Land Use Pattern, Circa 1838

North East

Nine Elms	ZONE 1	Short distance commuting to London. Movement of perishable foodstuffs to London. (These foodstuffs grown locally).
Clapham		Increasing suburbanisation, especially low density linear settlements.
	ZONE 2	Pockets of intensive vegetable production. (Town dung sent out from London). The same movement of agricultural products as ZONE 1.
Wimbledon		Filtering out of population (from London) in low density linear, middle class settlements.
	ZONE 3	Varied accessibility to London for both agricultural produce and communters.
Basingstoke		Roads and partly the Basingstoke Canal and the Wey navigation. Very little evidence of suburbanisation, but a variety of 'country seats'.

South West

holdings were small and normally held on twenty one year leases, which meant that these holdings were particularly susceptible to land use change at the expiry of the lease[40]. These garden grounds grew a variety of crops intensively, helped by the ease of procuring manure and the assured market in London. Both horse manure as well as night soil could be moved from the city to this zone easily by waggon[41]. As London had grown and prospered so had these garden grounds. Lyson (1812)[42] estimated that there were about five thousand acres of them within five miles of the metropolis, intensively cultivated for the supply of London markets with vegetables. Additionally about eight hundred acres cropped with fruit and seventeen hundred with potatoes. A further twelve hundred acres cropped various garden vegetables for cattle food. By this time, in the area of study, pockets of specialisation had become apparent[43]. In Battersea, for instance, asparagus was grown on a large scale[44]. Other crops were grown generally and were spreading south because of the high prices obtained for them. Potatoes were leading the way, but cabbages were grown only in the market and farming gardens five or six miles from London[46]. Garden beans were grown extensively and the growth of turnips had expanded, according to Stevenson, within the last fifteen years[46]. From this inner zone all these vegetables found a market at Covent Garden.

The keeping of cattle and hay production were important also in this inner zone as was milk production which was concentrated here and extended into the central area of London, its location reflecting both the lack of sophisticated transportation as well as the limitations of preservative technology. At the beginning of the nineteenth century estimates were made that about 8750 cows were required to keep London in milk[47]. At that time only 619 were found in Surrey particularly in Camberwell, Coldharbour, Kennington, Lambeth, Peckham and Newington[48]. The average yield (per cow) was a daily five gallons of milk in summer

and four in winter[49]. Nevertheless London milk was often diluted or sold in short measure indicating perhaps periodic shortage or the inability to supply the market completely as well as, on occasion, the desire to make a bigger profit. Little milk was made into butter or cheese, but the London cheese market was a large one and distributions were made into both Surrey and Sussex, supplies being obtained from both sea and river navigations. Even by 1800 cheese was being imported from both Holland and America[50]. Butter supplies too came from a wide area and again sea and river navigations were used. Supplies were obtained from Cambridgeshire and Suffolk, the West Country as well as Ireland and various continental locations[51]. Local markets acted as collection points and supplied small amounts as well. In Surrey, Croydon, Chertsey, Egham, Ewell, Farnham, Haslemere and Kingston all sent butter to London.

The relatively distant sources of both butter and cheese supplies indicated economic pressures on the land surrounding the city, as did the inability of local farmers to supply all the milk demanded. Additionally too in Surrey, certain crops had been displaced. Hunter noted the movement out of hay, whilst Stevenson commented further on the economic pressures encouraging land use change maintaining that the increase in luxury made it necessary to set aside land in the immediate neighbourhood of London for more valuable purposes than the raising of carrots[52]. He mentioned too the high price of labour in this zone and that, therefore, certain activities receeded further from the metropolis including vegetable growing and the raising of sheep for mutton. Stevenson remarked on the extension of the two way traffic of carts carrying night soil and manure out of London and bringing back hay and other products from Clapham, Wimbledon and Wandsworth.[53]

The second zone (between Clapham and Wimbledon) was influenced also by the demand for agricultural products in London. To an extent certain commodities had moved out, either because of land use pressures in the

inner zone or because growers did not find it profitable to grow these crops in the inner high rent, high wage, areas. Additionally, this second zone appeared to be one of adaptation and supplementation as well as of increasing specialisation. It had adapted to the land use pressures of inner suburbia, and was constantly adding to the agricultural activities it sustained, whilst others filtered out to the south and west. Many activities supplement those in the inner zone. In this second zone farms practised complicated rotations in order to preserve soil fertility. Often these consisted of growing cabbages, turnips, potatoes or peas, particularly for the London market. Stevenson had noted that other crops had to make way for these whenever they could be profitably introduced(54). The ease of transport of town dung, which moved eighteen to twenty miles by cart and (even further by water) supplemented the high soil fertility which had been induced by rotation(55). It allowed and encouraged the growing of wheat. High acreages of wheat were recorded in this zone in the 1801 crop returns and continued south west until they were out of the range of town dung(56). Returning waggons often brought back turnips which were much in demand by the 'great'* cow keepers who lived at such places as Camberwell in the first zone: growers near the Thames used barges to transport turnips to London.(57)

Of the specialist crops a number were important in this zone. Parsnips were grown on the deep rich lands of the parishes bordering the Thames, particularly between Wandsworth and Kingston. Potatoes centred in Mitcham, Tooting and Streatham, were much in demand in London and fetched high prices. A large proportion of hay was grown also in this zone. Mitcham specialised in physic plants (peppermint, lavender and camomile, aniseed, liquorice and poppies), the soil there having been rendered 'extremely rich by artificial means'(58). The meadowlands bordering the Thames were naturally fertile because of the overflow of the river but they had also been regularly dressed with very large coats

* great = large

of manure. The asparagus fields of Battersea were repeated in East Sheen and Mortlake along the river bank. The areas of very intensive agriculture were, however, small as a proportion of total cultivated land. Stevenson estimated that the physic garden at Mitcham occupied 250 acres, the market gardens at Putney 120 acres and those in Wandsworth 220 acres, and that the whole of the garden grounds in Surrey, occupying both the inner and second zone came to about 3,500 acres. This was considerably more than any other county surrounding London and came, in total, to nearly as much in Middlesex, Essex and Kent[59]. A noticable feature in both these zones was the lack of woodland as well as the considerable amount of common and heath.[60] The commons were, in Stevenson's view, underutilised. Kennington Common was used only for uncontrolled summer grazing. Mitcham Common, which extended for 550 acres, was used only as a cow pasture. Kingston Common (430 acres) was covered with furze and brambles. Norbeton (sic) Common (320 acres) was in a similar state. Wimbledon and Putney Commons (1,000 acres) had poor unwholesome pastures because of the lack of drainage. Wandsworth Common (350 acres) was covered with furze. Some of the inner commons, particularly Battersea and Clapham were, however, noted for their amenity.[61]

The third zone extended between Wimbledon and Basingstoke. It was a zone of varied accessibility to London. Rivers, the Basingstoke Canal and to an extent, turnpike roads allowed the easy movement of commodities to and from London. In this zone too, soils were an important consideration in determining land use, because their natural condition was not easily transformed by town based manure. The Upper Eocene Sands were, in particular, hungry and barren and avoided cultivation. Small towns, such as Basingstoke itself, provided important local markets for agricultural products and their catchment areas often included several southern counties. However, parts of the zone were still often virtually inaccessible

and were involved in a near self sufficient agriculture. Some of the northern parts of the zone, in contrast, were particularly concerned with garden crops and relied partially on town dung from London to enrich their soils.

James Malcolm had described London as the best market in the world for corn and noted that the early nineteenth century, about 50,000 acres of wheat were cultivated in Surrey[62]. Curtler mentioned that wheat was grown on the fine fertile soil around Basingstoke and was finding its way to London at the same time[63]. The importance of wheat in the area of study is confirmed by the 1801 Grop Returns for such parishes as Kingston, Long Ditton and Woking and these fulfilled the estimates put forward by promoters of the Basingstoke Canal in 1787[64]. Then they had estimated that the canal would carry 6,300 tons of flour annually as well as 600 tons of corn and seeds[65]. Stevenson too remarked on cereal production mentioning a very extensive tract of barley soil around Esher, Ockham, Cobham and Send[66]. He commented too on the further outward extension of carrot production as far as Chobham and Elsted (sic), and clover, which was used for fodder as well as a rotation crop, had penetrated the Weald[67]. Clover was made into hay: closer to London it was cut green and sold in bunches for horses and milch cows. Stevenson correlated sheep raising with the infertile sands between Farnham and Bagshot[68], and Marshall remarked on the small mean looking cattle who endured the same soils[69]. So poor were these animals that it was not considered worthwhile to drive them to London because of fatigue and weight loss[70]. The chalk soils around Basingstoke were generally superior and commanded higher rent. In 1805 this was about 20/- per acre whilst clay fetched only 16/- and sand about the same amount[71]. East of Basingstoke, however, the chalk changed quickly to sands and here the land was entirely open and was used for raising horses in a speculative horse trade. Horses were bought young in the Midlands, worked moderately

here and then sold in London.[72]

The further influence of London in this outer zone is demonstrated in the occurrence of fish ponds at Cobham, Byfleet and Frensham. Cooke (1812) had revealed that fish ponds on the western heaths had paid better than the cost of manuring the land. Carp was the principal fish raised and some merchants sent as many as 4,000 annually to the London markets.[73]

Farm records, as well as crop returns for this period are not only difficult to obtain but are only partially accurate. Panton noted that farmers, in this period, were loath to reveal crop acreages to the man who received a tithe and that they had good reasons for understatement[74]. The disparity of this is provided by a comparison of the 1801 Crop Returns with those compounded by Thomas Milne for his land use maps of 1795 and 1799. In Clapham, for instance, the Crop Returns showed 193 acres of arable: Milne computed 387. In Battersea the Crop Returns showed 370 acres and here Milne revealed 768. In Barnes, exceptionally, there was a measure of agreement (Crop Returns 257: Milne 254). Nevertheless the comparison gives an idea of the underestimations and evasions made by farmers in providing documentary evidence of land use at this time.[75]

In the area of study, therefore, agricultural land use showed a marked economic relationship to the requirements of London in the early nineteenth century. The first zone was a region of particularly intensive agriculture with very little spare land. Some of the agricultural pursuits of this zone were filtering out reaching a distance of as far as twenty miles from London, the break here being the distance at which it was no longer economic to transport manure from London by waggon. Obvious and important modifications were made by the river and canal systems, which allowed bridgeheads of activity into regions of part self sufficiency. Previous to the river cuts and canal constructions, these areas had

produced only high order goods (which could bear the high transport charges) to the London market. There is also evidence of labour shortage and unrest in the area of study. Stevenson noted that it was difficult to get sufficient numbers of hands to work the land properly in some Surrey locations and that servants were extremely unsettled, often wandering from one master to another(76). The shortage, in Surrey, was, in part accounted for by the vicinity of London, but it was also a reflection of the intensive labour requirements of many operators. It is interesting to note the revelations of Vancouver in Hampshire for the same period in which he comments on the unrest, but says little of labour shortages.

Settlement patterns and settlement function fitted broadly into the three zones revealed for agricultural land use. In the eighteen thirties, the areas between Nine Elms and Clapham was one of a moderate density of population with settlement concentrated as ribbon development utilising the existing coaching roads between London, Kingston and Wandsworth. The settlement texture was revealed by Stevenson who described housing as belonging to such as could hardly be called the landed proprietors, and that the whole of their property consisted of a few acres of meadow and pasture ground as well as the gardens and pleasure grounds which were attached to the houses(77). Nevertheless, these proprietors were considered significant enough to resist the building of the Southampton and London railway over their land. The original terminal site of the railway was to be at Nine Elms which consisted of poor property which was described as 'very wretched'(78). Here superior property was situated on the higher ground of the river terraces which was economically as well as physically, unattractive to the railway company. Cooke (1812) described Clapham as a very populous parish and the residence of many genteel families(79), and this view is further confirmed by Pigot (1839) who described Clapham as an extensive

village which had, for many years, been considered one of the most respectable and pleasant of those which environ the metropolis. He remarked on the elegant mansions which lined the main roads. Away from these, such activities as brewing were carried out. Stevenson noted the large number of hogs which were kept in the area between Clapham and Wandsworth: these were fed on some of the waste products of the breweries of Wandsworth, Battersea and Vauxhall. Seven breweries were listed by Pigot in Clapham alone(80). The facility with which commuters could reach London from Clapham at the time is shown by Critchett (1829) who noted coach services every half hour to the City.(81)

In the second zone, between Clapham and Wimbledon, the settlement pattern was considerably different. The linear pattern of settlement persisted along the main roads, but the houses, as well as their grounds, were larger, and the settlement pattern was discontinuous at the southern margins. Away from the main roads settlement was sparse and there was not the evidence of backfilling shown in the first zone. Common fields often stretched right up to the gardens of the large houses. The first significant country seat was Wimbledon Park. Wandsworth was an important manufacturing centre. The River Wandle had provied a great asset to the town in terms of water power and the Surrey Iron Railway, which extended as far as Croydon, enlarged Wandsworth's hinterland. Cooke listed dyers, calico printers, mills, foundaries, vinegar works, breweries and distilleries as Wandsworth's industries(82). Stevenson remarked on the large basin, carved out of the Thames Wandle confluence, which could hold more than thirty barges(83). In 1839 Wandsworth held a twice weekly market which stressed its local importance. Wimbledon was much smaller and less significant. Cooke commented chiefly on the Park which had been laid out with great taste by Brown(84). Pigot described Wimbledon as beautiful and highly genteel and noted the surrounding seats of the nobility and gentry(85). Both, however, commented on industry: The English Copper

Company's works was situated in this parish.[86]

The northern edge of the third zone showed a continuation of the features of the second, particularly in the discontinuous, low density settlement along the main roads. This was especially noticable along the Portsmouth Road until Kingston was reached. Thereafter the road carried very little linear settlement. Kingston was, in 1839,an important urban centre, owing little to the proximity of London. Until 1729 it had been the first bridging point on the Thames above London Bridge and the market, held as often as thrice weekly, was protected by an ancient Royal charter: no other market was allowed within seven miles of the town[87]. Cooke had computed that Kingston possessed 716 houses[88] in 1819 and Pigot described trade as being principally of malt, but that there were also flour and oil mills, two distilleries and several extensive breweries[89]. Kingston enjoyed too an important trade in sending barley and malt to London by barge and recent improvements in navigation, such as the construction of a weir, had helped this prosper. Pigot credited Kingston with five brewers, fourteen malsters, nine market gardeners and two boat builders amongst the local occupations. It was also a local banking centre[90]. Bate (1836) revealed nineteen daily coach services chiefly between London and the coast and the Royal Mail services used Kingston also as a stopping place. And, in December 1833 John Atterbury surveyed coach traffic at Kingston as evidence for the Parliamentary Committee investigating the Southampton and London Railway showing that, at this time of year, coach numbers ranged from fourteen to forty one daily and passengers from 110 to 262.[91]

In contrast to Kingston, Surbiton was, at this time, described as a hamlet[92]. The chief residential feature was Surbiton Place, a large villa, which had gardens extending down to the Thames. Weybridge had a population of 930 in 1831 and was considered either too small or too unimportant to be mentioned by either Cooke or Pigot. Walton was larger, but still not mentioned, probably because it was very much a small town

of working people. The area between Surbiton and Woking was characterised, however, by country parks such as Claremont, Esher Place, Woburn Farm and Painshill, all of which had their origins in the fashion established by William Kent, Charles Bridgman and Lancelot Brown, which diffused easily from the scene of its original success, Twickenham(93). The infertile heathland soils on which the parks were sited took easily to the new shrubs imported from America and which were an important part of the assemblage. Woking was described as being so out of the way that it was little known or frequented and certainly, by the time Woking was reached, the population density had thinned(94). Additionally the country parks had diminished and the infertile, thinly peopled heathlands that continued to just short of Basingstoke, prevailed.

Basingstoke was an important agricultural and route centre. Trade had increased with both the opening of the canal in 1786 and with the enclosure of the Common Fields in the same year(95). Vancouver listed the manufactures as malt and leather and noted too the peat dug at the surrounding commons of Cove and Farnborough as well as Aldershot and moved by the canal(96). Again the importance of Basingstoke as a coaching centre is shown in the evidence to the Parliamentary Committee when the same John Atterbury made a survey in November 1833. The number of coaches ranged from thirteen to thirty five daily and passengers from 56 to 229(97). Bate's directory confirmed the importance of Basingstoke as a coaching centre (twelve coaches daily from London) as well as the importance of the town as a link with the coast and the West Country(98). The discrepancy between Bate and Atterbury can be explained by local and cross country coach traffic which demonstrated the early complexity of traffic along the route to be taken by the railway.

Evidence of Change in the 1838 Land Use Pattern

In the early part of the nineteenth century the physical expansion of London was hampered by restrictions imposed by transport law as has

been demonstrated previously. Moore's description of 'small, compact and very congested' reflected a physical state which many were keen to change[99]. She remarked that thousands had a daily walk, and often a long one, night and morning to their place of work. Often workers were willing to pay for short cuts and there were a variety of 'halfpenny hatches' which went through private fields and lands[100]. If working people, in the eighteen thirties, were willing to pay to walk to work, it is reasonable to assume that they would pay to travel to work cheaply. They were, however, frustrated by a variety of complicated factors, which certainly inhibited the cheapest form of transport of the day, the coach, from making an impact. Coaches could not, if they had their origins outside the Bills of Mortality, either set up or set down passengers within the Bills area and had to wait until the city was reached. The Bills consisted of the parishes of the City of London, without and within the walls, Westminster, Southwark, fifteen 'out' parishes as well as others which were added when the Plague had visited England[101]. In the area of study the limit of the Bills was Clapham Rise and the boundary then stretched eastwards to Camberwell. Thus the starting point of coaches concentrated on these limits because coach operators did not wish to risk running them empty. In 1825, Clapham had fifty seven return journeys by short stage to London daily and Camberwell 104[102]. Fares on the short stage were high, a fare of 1/6d or 2/- from Clapham to the City or West End being common. Advanced booking was necessary and often coaches stopped at private houses to set up or set down passengers. Journey timings were slow and unreliable[103]. Operating costs were high and horses, for instance, cost about £20. The work for them was hard and they had to be replaced frequently. The costs of food and stabling were also excessive. Coach design was traditionally, elaborate and a coach cost in the region of £100. The situation was compounded by a high duty

of either 2½d or 3d per journey seat and this duty was charged whether or not the seat was occupied. The rate of duty was reduced, but not abolished, in 1839. With this heavy duty in combination with the other steep initial movement costs, more owners were disinclined to experiment or to venture beyond the Bills, least traffic either did not materialise or they were left with empty, yet still taxed, seats.(104)

There were, however, loopholes in this system. In 1829 G. Shillibeer obtained a licence for a horse drawn omnibus which utilised the New Road from Paddington to the Bank which was outside Bills of Mortality legislation. This omnibus kept to a regular timetable, carried more passengers than the stage coaches and was much cheaper to operate. It was able to charge cheaper fares than the coaches and appealed, therefore, to the less wealthy. There were various vicissitudes in its operation, however, including Shillibeer's bankruptcy, which tended to subdue its spread through the city. By 1831 Shillibeer had recovered financially and gave evidence to the Parliamentary Committee which was considering ending the Hackney Coach monopoly. Shillibeer believed that the omnibus should benefit especially the 'middling classes of tradespeople whose finances could not admit of the accommodation of a hackney coach'(105). By the late eighteen thirties the omnibus had penetrated the North West London suburbs and in 1838, at the time of the opening of the Southampton and London Railway, Clapham had nineteen return daily omnibus services to Gracechurch Street, Wandsworth had six and Wimbledon one(106). Thus, at the beginning of the period of study, there is evidence of transport provision for the lower end of the social scale as well as a widening of the operational area of commuter transport.

If, in 1838, there was congestion in the inner city in terms of population distribution, there was congestion also in commercial activities. The London food markets provide one such example. Already Covent Garden and Hungerford market had been rebuilt by Charles Fowler but this had

provided an insufficient relief and Nine Elms was considered a suitable site for the distribution of produce which would partially relieve the congestion[107]. Already, however, some of the concomitant activities of these markets were a nuisance to public health (the slaughterhouses were, especially, a case in point), and there were difficulties in getting sufficient regular supplies as well as the right quality, of produce. County killed meat was available, but farmers found difficulty in getting it to the capital[108]. If driven to market, beasts wasted so much (40 - 60 lb. was common) that this method was not generally considered worthwhile[109]. Other suppliers sensed the potential demand but were not able to satisfy it. Butter, for instance, was sent to London by coach from Taunton and suppliers would have sent more if the expenses were not so great[110]. Much meat was sent to London from Salisbury and more could have been sent if transport had been better and, particularly, if there had been a railway from London to Basingstoke[111]. There seemed little doubt that London required greater amounts of commodities as the population rose, and that farmers and others were willing and able to supply these, but were inhibited by poor transport provision. In terms of land use change in the inner city if the food provision for London was reorganised then land would be freed either for residential or commercial development.

The Southampton and London Railway Company believed that the construction of the line would further enlarge the catchment area of London. Brixham's fish, for instance could be sent to Southampton and then on, by rail, to London[112]. The meeting of the committee which drew up the prospectus for the railway (at the London Tavern on 23rd January 1832) listed the potential commercial advantages of the building of the line. For many the influence on land utilisation was implicit and they included :- [113]

1) The increase in passengers when conveyed at 20 m.p.h. and at half the present expense.

2) The additional supplies of butchers' meat to London markets.

3) The supply of fish from the Channel and West of England.

4) The conveyance of live sheep and lambs to the London market.

5) The conveyance of foreign fruit, poultry and eggs.

6) The conveyance of grain, agricultural products, building materials, manures and chalk.

7) The movement of troops and naval and military stores.

The memories of the Napoleonic Wars and the becalming of sailing ships in the Channel made the potential movement of troops an important political consideration in seeking Parliamentary sanction for the building of the railway and it paved the way for an important subsequent element of land use, the building of military and naval camps along the line(114). Finally, between London and Southampton, the Railway Company estimated that within ten miles of the proposed line were around 135,000 people. For these the costs of various commodities could be cut, coal by about a half and numerous foodstuffs by very little less. Local produce could be moved, often for the first time, by relatively rapid and cheap transport.(115)

Thus there seemed little doubt in 1838 that changes in land use patterns along the line of the London and South Western Railway to be investigated, would be adapted and accelerated by the building of part of its eventual system, the Southampton and London Railway.

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Date		Coaches	Passengers	Waggons	Waggon Horses
4th Dec.	Wed.	26	130	1	5
5th Dec.	Thur.	41	262	32	106
6th Dec.	Fri.	41	258	49	179
7th Dec.	Sat.	41	265	3	12
8th Dec.	Sun.	14	110	9	28
9th Dec.	Mon.	41	224	18	59
10th Dec.	Tues.	41	236	28	89

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Date		Coaches	Passengers	Waggons	Waggon Horses
3rd Nov.	Sun.	13	56	9	46
4th Nov.	Mon.	35	194	5	31
5th Nov.	Tues.	35	209	12	59
6th Nov.	Wed.	33	178	4	24
7th Nov.	Thur.	34	229	8	45
8th Nov.	Fri.	32	180	6	37
9th Nov.	Sat.	34	200	5	36

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CHAPTER 4

LAND USE ALONG THE LINE IN 1871

Economic Background to Land Use Change: 1838 - 1871

Best (1971) noted that, by 1850, Britain was, by far, the richest country in the world. Thereafter, the gross national income continued to rise, reaching £523.3m. in 1851: £668.0m in 1861 and £916.6m in 1871[1]. Concomitant with this rise in national income were structural changes in industrial disposition, as well as personal income distribution, which were to have important spatial effects, particularly on the texture of existing land utilisation.[2]

Best noted the decline in the proportion of the working population involved in agriculture, from 22.1% in 1841 to 14.2% in 1871, as well as the growth in the proportions involved in manufacturing and mining from 34.4% to 38.1%, and in building from 18.4% to 22.0% in the same period. Building, manufacturing and mining are largely urban pursuits, and the growth of towns and cities during this period is particularly pronounced[3]. London, for instance, grew from 2.68m in 1851 to 3.88m in 1871.[4]

Especially significant, in the spatial context for the Greater London area, was the growth of middle class incomes. Best makes the point that, during a period of a rise in the national income, wage earners did not increase their share proportionally[5]. This is substantiated by an examination of contemporary returns to the Inland Revenue, where there is evidence that those with above wage earner level benefitted substantially from the rise in national income[6]. The middle classes were predominantly urban: they were involved especially in producing or distributing the growing volume of manufactures and raw materials, or were initiating the developing ranges of consumer goods and services which increased national wealth demand[7]. These activities made a profound spatial impact, and were vested in new streets, parades of houses

and shops, as well as individual large houses in quite substantial grounds. The middle classes stressed especially, social distinction by social segregation, which helped emphasise the wealth they had either acquired or created.

Booth (1866) by an investigation of census material, gave an account of middle class occupations[8]. (This work was extended, subsequently, by other authorities). Nationally, from 1851 - 1871, the rising professions included law, medicine, education and religion. Clerks, accountants and bankers grew significantly from 0.5% of the total working population of England and Wales in 1851, to 1.1% in 1871: those involved in trade, wholesaling and retailing from 6.5% to 7.8% and those in public administration from 0.6% to 0.7%. Booth estimated that the growth of these occupations was greater (both relatively and absolutely) in London than elsewhere. There are important spatial consequences of this growth and concentration. First is the style in which these rising middle classes preferred to live. 'The Architect' in 1873 noted that suburbanisation was increasing, that commuting into London from twenty to thirty miles out was common, and that more and more large tracts of land were being covered with 'those attractive nests called villas'. ('The Architect's definition of a villa was a house valued at £1,500 to £2,000 and occupying half an acre of ground[9].) Second is the economic multiplier effect of this settlement pattern. Booth maintained that even at its base, the middle class could afford one domestic servant, and 'The Architect' believed that the norm for the sort of property it was describing included two stable servants, several maids, a coachman and a gardener. In addition to this dispersal of population, which followed in the wake of the migrating middle classes, small towns and villages were reinforced as service centres for these new and quite affluent settlers[10]. Thus there was a tendency for an above average increase in population in some areas with easy contact

with large towns and cities. Booth mentioned also, that the period 1851 - 1871 was one of considerable growth in the number of houseservants. Nationally, housemaids number 49,885 in 1851 had increased by 105.9% in 1861 and by a further 7.8% in 1871. Housekeepers numbered 46,648 in 1851 and had increased by 42.4% in 1861 and by a further 112.1% in 1871. And coachmen (an important status symbol of the day) numbered 7030 in 1851, had risen by 69.2% in 1861, and by a further 36% in 1871.(11)

By 1871 there is some evidence that the advance in national prosperity had filtered down the social scale, and many authorities agree that, by the early seventies, a substantial rise in wage rates was incontrovertible(12). A tendency to require greater personal space as well as to demand consumers' goods in larger quantities, became a characteristic of wage earners, as well as of other sections of the community.

By an examination of the 1861 census material, Hall (1962) has shown that London was then the chief manufacturing centre of Great Britain(13). He noted that there was a great subdivision of employments as well as the multiciplicity of objects produced, which were, as he says, 'good reasons for the failure of nineteenth century observers to appreciate the importance of London manufacturing'. The characteristic industries of the Industrial Revolution which, because of their noise, smoke and grime, were instantly recognisable, were feebly developed in the capital city. In 1861 Greater London (using the boundaries of local government re-organisation of 1965) contained 24.3% of the national service industries, 14.9% of the manufacturing industries, as well as 1.9% of the primary workers of the country. Then the leading industrial activity in London was that of 'miscellaneous services' (25.2% of the total working population of Greater London), followed by clothing (13.3%) and the distributive trades (9.4%)(14). These industries were concentrated in small premises, especially within the central area of London itself. Using a location quotient devised by P. Sargent Florence (Cambridge 1948) Hall discovered

that, within the central area, only Westminster and St. Marylebone had location quotients below unity and that there was, in 1861, a marked manufacturing area immediately south of the river in Lambeth, and that along the route of the London and South Western Railway in the 1965 Greater London area, there was a location quotient of above unity(15). There is no doubt, that the main contribution here came from the service industry, which reflected the growth of middle class suburbs and was induced by them.

By 1871, therefore, there was increasing competition for land within the central area of London and other large cities. And it was emerging, that for certain activities, a central city location was crucial. 'The Architect' noted that land values in the city of London had risen to £40. per foot near the Royal Exchange by 1871, and that in Cheapside, Holborn and Ludgate rents were now a quarter of this(16). It was believed that a dispersal of some trades from central London was likely because these trades could not support such high rents. 'The Architect' commented too on what amounted to the very rich and the very poor remaining in a central location. By 1873 this journal estimated that only the upper ten thousand and the abject poor remained in a central location(17). 'The Builder' (1871) commented on the displacement of certain trading activities from central London and gave evidence that certain large companies, such as the East India Company and the Hudson's Bay Company were moving out and realising capital gains. This journal cited the discovery of gold in Australia and California as contributing to the rise in land values in central London(18). There is no doubt that the growth and concentration of commercial activity reflected the economic advance of the nation, and that concentration, as well as dispersal, had been assisted substantially by transport innovation, especially that associated with the railway and the steamship. 'The railways have set us all moving far away from London'. (That is, those with an income of at least

£300 - £500 per annum) continued 'The Architect'[19]. Olsen (1976) remarked that much of the new building in central London was not residential, consisting of clubs, joint stock banks, hotels, restaurants, theatres, office blocks and departmental stores, which all took up substantial space.[20]

Population dispersal, and changes in the texture of existing residential locations were partly the accomplishment of improved administration as well as the result of economic forces. Numerous sanitary laws had made an impact by 1871 and were then gathering momentum[21]. Horrified by disease in cities, and especially the effects on the newly affluent classes, Parliament passed the first Public Health Act in 1848 and allowed local authorities to clear residential areas when the death rate there rose to 23 per thousand. Subsequent Parliamentary Acts had reinforced these powers, notably the Artizans' and Labourers' Dwellings Act of 1868 which was concerned, particularly, with insanitary housing, and allowed local authorities to clear and redevelop an insanitary area. So by 1871, local authorities had the power to condemn and to demolish, but none to erect new dwellings, and the displaced poor migrated to other areas where the conditions were either slightly superior or the local authorities less vigilant or more tolerant.[22]

Other slight changes in the existing residential fabric had been provided by the Lodging House Act of 1851, by which local authorities were allowed to erect respectable dormitories to alleviate overcrowding[23]. London was particularly slow at adopting this provision. Building Societies, which, as previously noted, had their origins in eighteenth century building clubs, assisted tradespeople build property, either in the gaps left by clearance or on other small vacant sites within the existing built up area. By 1871, however, there is evidence that societies were operating on the edge of the city. It is possible to use the date of the foundation of a building society as a guide to the commencement of

building activity in a particular suburban area[24]. In the area of study the Lambeth (1852) and the Clapham (1873) are cases in point.[25]

It is, however, those buildings associated with philanthropic organisations which give the key to the economic, social and spatial constraints of the period. Thus the Society for Improving the Conditions of the Labouring Classes; the Metropolitan Association and the Improved Industrial Dwelling Company all built high (at least five storeys) and built away from the central area (where land prices were too high) but generally within the existing built up area or, at most, on the then existing urban fringe. To go out further, would have meant a journey to work which, although theoretically possible by rail, the average worker of 1871 could not afford.[26]

Thus the combination of the fear of disease and the erection of new working class housing, the rise in incomes as well as the possibility of railway travel to work, stimulated the middle classes to a greater selectivity of residential location in 1871 than ever before. The period 1838 - 1871 is one of the emergence of the differential social class as an element in suburban residential location. The influential journals of the day, 'The Builder", 'The Architect' and 'Building News' reinforce this inclination and process by the categgnisation of buildings into classes. Thus South Lambeth was described in 'The Builder' as having experienced the almost incalculable erection of rows of first, second and third rate buildings, and here certain streets were named as having buildings (and presumably residents) of a particular numerical category.[27]

Ominously too, the Education Act of 1870, which caused the subsequent emergence of compulsory elementary schooling required the clearance of land in the inner city (as well as some of the inner suburbs) for school buildings[28]. Lists of this building activity occur in 'Building News', the 'Builder' as well as the 'Architect' testify to the extent of this activity.

Railways and Land Use Change

By 1871 the railway system of Great London was already making its impact on land utilisation. In terms of passenger traffic, most companies were interested in the middle to long distance market; this they ran with some efficiency, virtually eliminating the stage coach routes which had run parallel to the railway lines[29]. The short distance passenger traffic into London was, in 1871, being successfully operated by omnibus proprietors, especially since the abolition of milage duty in 1846. Suburban bus traffic had developed substantially south of the Thames during the 1860s but terminatdd on the periphery of the city because of internal congestion there[30]. Traffic congestion in central London was a powerful, yet partial, component of residential and transport change. The 'Railway Times' (1850) has asked why about 100,000 people could not live out of London as far (in the south) as Kingston, Epsom and Banstead Downs[31]. The Royal Commission on London's Traffic of 1865 had commented on the congestion in the central area, and recommended railways, horse tramways as well as population dispersal as means of solving this problem[32]. The London and South Western Railway had opened links with the city to exploit time lost from the internal road congestion as well as to gain passengers. In 1866 a rail link was initiated from Battersea to Ludgate Hill and, at the same time, in combination with the Great Western Railway, the company took an interest in the West London Extension Railway which originated at Clapham Junction. Partially exploiting some of these new developments, in 1863 the direct Kingston line was opened, linking Kingston to the main line at Coombe and Malden. Perhaps too spurred on by the Royal Commission's report, Parliament in 1869, passed bills for horse drawn tramways from the Elephant to Clapham. Again as a result of Parliamentary pressure, some railway companies (but not yet the London and South Western) had introduced cheap worken's fares from 1864.[33]

Land, along the railways had increased in value, and often dramatically, by 1871. 'The Builder' (1869) noted that the larger increasss in land values were near a railway station where there were facilities for the transport of produce, manure and machinery. There was also the possibility of the development of dormant, potentially building, land along the line. Generally in 1871, it was estimated that land values near railway stations rose by 5 - 10% when the railway arrived.(34)

The effect of the railway on adjacent farm land, particularly in the area of study, was dramatic. Prior to the coming of the railway light land was valued, as arable, at 30/- per acre. When the railway arrived it immediately became potential dairy land and its value increased by 40%(35). Because of operational technical constraints as well as constructional costs, railway stations were often infrequently placed along the line. 'The Builder' commented that where agricultural land was cut by the railway, yet not station was built, there was little increase in the value of agricultural land. Landowners were urged to acquire a station whenever their land was crossed by the railway. 'The Builder' pressed too, for accommodation trains as well as for sidings for the more important farms and estates.(36)

A feature of passenger traffic during this period was the introduction of off peak shopping trains, allowing the middle classes access to the large London departmental stores which were then beginning to emerge. (The Civil Service Stores, for instance opened in 1865). Additionally, this shopping facility was yet another inducement for population dispersal to the suburbs.(34)

In the period 1838 - 1871 agriculture had been characterised by rising rents (as has been previously indicated) as well as rising profits. And as with housing, there were, initially, changes in the texture of the existing land use, rather than the substitution of agricultural land use

of another type. Ernle (1922) remarked that, by 1871, fertilizer was being used more extensively and was producing higher yields, that stock was more numerous as well as being better bred and better housed and that farms enjoyed varied improvements of every kind[38]. These innovations and improvements indicated a more intensive use of the land. And they had to take place, for the fast growing industrial population was still fed, in 1871, largely by indigenous resources. There had been changes, too, in the nature of agricultural holdings since 1838. In 1838 holdings had been small, the open field system was still important and agricultural techniques, in many instances, were still primitive. In 1840 the Royal Agricultural Society of England was founded and the R.A.S.E. journal, encouraged by the contemporary introduction of the prepaid postal service, and assisted by the railways for its distribution, brought new ideas to the notice of the farmers. Thus the railways assisted in the process of innovation, diffusion and change in agricultural ideas and techniques, as well as being able to transport new machinery, fertilizers and stock, and such bulky items as field drains and road metal, to farmers who required them.[39]

Thus the railways assisted in increasing agricultural output. They took an interest in the transport of Peruvian guano (first introduced in 1835) as well as in bones and dried blood from the London slaughterhouses, (from the late 1840's) and, because so many farmers were in contact with new ideas, helped forster competition[40]. By 1871, British railways interests abroad increased competition for the farmer and by the same date, elementary refrigeration techniques, as well as other developments in food preservation, were increasing the range of such competition.

Parliamentary legislation, in combination with the railway companies, assisted in agricultural change. Drainage schemes were often encouraged by the Enclosure Commissioners, and the introduction of barbed wire from mid century, helped with the inclosure process, especially in the

maintenance of pedigree stock which emerged significantly during this period.(41)

The further utilisation of agricultural machinerywas assisted by the Gangs Act of 1869, which precluded children from working in poorly paid itinerant gangs, performing such menial tasks as weeding. As a result of the Act there was a more stable agricultural labour force who settled in newly built agricultural cottages. The Education Act of 1870 further restricted the use of children as agricultural workers and farmers turned increasingly to agricultural machinery, distributed chiefly by rail.(42)

Add there are yet two further elements in the textural change of agricultural land utilisation during this period. The Inclosure Act of 1845 made provision for allotments to be set out under the management of allotment wardens. These small holdings, which did not generally exceed a quarter of an acre were not enthusiastically taken up initially, but the idea was taken up by railway companies (probably with the intention of keeping staff occupied between trains) and railway cottages, strung out along the line, with areas of allotment garden, were an indirect result of the Act(43). The second element was the Metropolitan Commons Act which was made law in 1876. After inclosure, many commons were considered agriculturally redundant. Indeed, during the process of inclosure, common lands had been repeatedly crossed by the railways as the acquisition cost of this land was generally lower than for alternative. In 1865, an interest group, the Commons Preservation Society, was active in London, and attempted to resist further incursions into common land and succeeding eventually in preserving the metropolitan commons for recreational purposes by the Act of 1876.(44)

Land Use in the Area of the Study: 1871

Contemporary Ordnance Survey maps showed a continuously built up area from Nine Elms to Clapham as well as a built up area along the north

west side of the railway until the Wandle valley was reached[45]. In the whole of this area there had been substantial changes since 1838. First, agricultural activity was very slight in Clapham, and the number of cow houses, in particular, had been greatly reduced. The Agricultural Statistics for 1870 (table 4), however, show that this tendency was not repeated in nearby Camberwell and Lambeth: it is possible (but there is no remaining evidence) that Clapham was a centre of the cattle plague, but the impact of the railway on milk production and location, in combination with advancing dairy technology at this time has already been discussed. Second, in this area, there is no doubt that there had been a substantial amount of infilling, as the large houses, noted by both Cooke and Pigot, had begun to be pulled down. Building activity too, had commenced away from the main roads, and drainage activities on lands susceptible to flooding from the Thames, and often associated with further railway building, were partly available for further residential constructions. The increase in house number during part of this period is noticable, particularly in Battersea (3125 - 7914), but substantial increases, in absolute terms, for the same period (1861 - 1871) were recorded in Wandsworth (1909 - 2664) and Clapham (3404 - 4334)[46]. Nevertheless, market gardens still 'abounded along the railway line at Battersea', according to Measom (1864[47], and Olsen (1976)[48] noted that, in the period 1843 - 67, urban expansion in this area was specifically along the main roads, but that, from 1867, this extension halted for a while, and that there was infilling and especially, backfilling, around the railways. There are a number of possible explanations as to this type of urban growth. The first is that the London and South Western Railway was not yet interested in cheap fares, there was too the problem of the length of working hours (which has been discussed in a previous section), but importantly, there was the positive influence of the short haul cheap horse trams, which were helping to concentrate population within

a limited area. Clapham was reached by these services in 1871 and much of the additional housing along the route was for working people. 'Building News' described Battersea as 'rows of houses - by the hundred'[49]. The same sort of property had appeared in south Lambeth, in the Wandsworth Road and in Vauxhall as early as the late 1840's[50]. 'The Architect' complained of mean looking, narrow houses along the Lambeth Road and the same journal regretted the settling of self made men from the city into select areas[51]. (Such people were defined, for example, as a settler from Smithfield Market and a man in the baby linen line from High Holborn). 'The Builder' considered that this displacement of business and residences from central London to be inevitable, and noted that even the removal of certain activities, such as Smithfield Market to Islington and some of the public offices to the western part of the city did nothing to check the pressures on the central area. The same edition of 'The Builder' reported a meeting to save Wandsworth Common from building, as well as a letter campaigning for cheap fares, and reported that a large number of people were using workmen's tickets which had recently been introduced from Battersea to Central London. So there is considerable evidence of spatial pressure in the area between Nine Elms and Wandsworth in 1871, pressure generated from economic circumstances derived from central London itself, and persisting in this area and not dispersing, because of a combination of social, technological and economic constraints. And there is no doubt that physical geography played a part as well, for apart from the area at its confluence with the Thames, the Wandle valley proved to be a formidable barrier to building progress and was, in 1871, the first real break in the continuous settlement along the route of the London and South Western Railway.

Once the Wandle valley was crossed, there was evidence of the filtering out of the more prosperous classes. North west of the line, the core of Wimbledon village was still present on its hill top site, but

the sides of the hill, particularly to the north and west, were partially covered with low density, high value, residential property cited, in 'The Architect' as being worth between £1,500 and £2,000 and having about half an acre of ground as well as providing very good evidence of the filtering out of the middle classes[52]. Evidence of the growing importance of Wimbledon for commuting is provided by Bradshaw (1872) when ten trains left Waterloo between 4 pm and 6 pm for Wimbledon compared with only one in 1848[53]. South East of the London and South Western Railway at Wimbledon, higher density, predominantly working class property, had grown up, occupiers, to an extent, finding employment in the industries of the middle Wandle and partly working in London. There were too signs of development of working terraces on the north west side of the railway between Wimbledon and Raynes Park. There had been a spurt in housebuilding in Wimbledon between 1861 and 1871. Wimbledon possessed 773 houses in 1861 and 1479 ten years later. This increase was accompanied by a rapid rise in population from 2090 to 9087, during the same period.

Both the Beverley Brook and the Hogsmill river provided emphatic breaks in the almost continuous line of settlement along this stretch of railway line and Malden between these two rivers, was a growing town with low density middle class housing at a discreet distance from the railway line, particularly to the north west and south west of the Station. The station was still known as Coombe and Malden, Coombe being a small village about one mile to the north. Malden's population had risen slowly from 1861 to 1871 (from 320 to 426) and the number of houses had grown from 59 to 70. Four commuter trains left Waterloo for Coombe and Malden between 4 pm and 6 pm in 1872: none had done so in 1848. Malden, Wimbledon and Wandsworth all had farms of over 100 acres in 1870 (see Agricultural Statistics) and it is interesting to observe that whereas Wandsworth had a comparatively large number of dairy cattle, Coombe and

Malden did not, and the persistence of small dairy operators near London is confirmed. Orwin and Whetham (1971) have remarked that the south eastern counties grew more oats than barley, at this time, because London was an insatiable market for horse fodder (which was transported largely by rail) and this is confirmed again by the 1870 Agricultural Statistics.(54)

Surbiton was, in 1871, a substantial settlement in its own right and had physically united with Kingston. At Surbiton the railway had had a dramatic effect on land prices and 'The Builder' reported that before the railway came land in Surbiton was fetching £50 per acre and that now the owner was afraid to say what the price would be. Further down the line at Weybridge land was selling for £18 - £20 per acre before the railway came and now fetched that amount in ground rent. Between these two places was some of the poorest land, hungry sand, which in 1838 was selling for £10 per acre: in the late sixties the price was £125. Between Surbiton and Kingston were large areas of low density, middle class housing, situated in wide avenues, often radiating from Surbiton station and approaching the river. Kingston itself had grown considerably since 1838, both to the north and south of the station and the newly opened direct Kingston line was a further stimulation to building activity and suburbanisation. The coming of the railway to Kingston Junction (now Surbiton) in 1838 had had an immediate effect on Kingston's trade and functions. By 1840 Merryweather reported that there were seventeen vacant malthouses and the large river trade in coal had substantially declined(55). But by 1872 Surbiton had assumed commuting importance, having six trains leaving for it from Waterloo between 4 pm and 6 pm.

Webber (1968) commented on market gardening moving out of London when the railways came and cites examples of market gardeners selling their land, in the inner suburbs, at good profits. Some, for instance, left Clapham and Battersea and settled at Twickenham. Along the line

of the London and South Western Railway, between Esher and Walton, the land, on the north side, had a number of advantages for market gardners. Initially town manure could be moved easily there from London by boat, but by 1871 this was being achieved by rail. The Flood Plain gravel and the alluvium associated with the River Mole's distributaries, provided naturally warm soils, but these advantages were offset partly by the large number of drainage ditches which had to be provided. The expense of drainage made this land unattractive, at this time, for residential development. The importance of Walton, agriculturally, and the significance of the small holdings can be noted from the Agricultural Statistics.

In 1871 Esher was still small (population 1815 : houses 308) and had grown slowly since 1861 (population 1460 : houses 254) the bulk of the settlement, as well as the core of the town, was some distance from the station. A similar situation existed at Walton where there was a small settlement by the station and the bulk of the town some distance away by the river. Walton's population had, however, increased significantly since 1861 (then 4010 : 1871 5383) and the number of houses had grown from 728 to 1000. Weybridge had a more significant mid Victorian core around the station, whence there was peripheral, low density, contemporary housing. Agriculturally, Weybridge was less significant than Walton, an inhibiting factor being the hungry sandy soil. When the railway crossed the Wey valley this was found to be avoided by settlement and there was yet another tract of pasture land.

Woking too, had grown significantly since 1861 (the population had grown from 3819 to 6586 and the houses from 681 to 872) for a variety of reasons. First a male convict prison had been built and opened in 1859 and required a substantial number of staff to operate it. The Royal Dramatic College had opened also, but, most importantly, the largest landowner in Woking, the Necropolis Company, had recently released land

for residential development[56]. There were a string of railway cottages along the line, for Woking had large sidings as well as being a base for maintenance work for the railway company. The prison and the Necropolis company were substantial users of the railway. The London and South Western Railway was most anxious that further building work should be achieved at Woking and by 1871 the company had completed its drainage requirements under the 1866 Sanitary Act, but were frustrated.in their development plans by other land owners, notably George Rastrict, who owned land south of the line and was most dilatory in his drainage schemes. Agriculturally, Woking was a mixed area, there were a number of large landowners and the town sent milk and fodder to London. A letter in 'The Surrey Advertiser' in 1869 mentioned the lack of guano as a fertilizer in the vicinity, presumably indicating a potential source of freight revenue for the railway company. But by 1800 Woking had been important for its nurseries and a Michael Waterer held large areas of land growing American plants and shrubs: by 1871 a number of other nurserymen had migrated away from London. Apart from the adventitious settlement of Waterer, Woking had a variety of location and physical advantages for this activity. The Bagshot Sand soil was light, warm and well drained as well as being easily manured. The flowers and shrubs could be moved to London and elsewhere easily by train. There is evidence that, by 1871, Woking shrubs were finding a national market[57]. By 1871 the development of new Woking was well under way (Old Woking was 1½ miles from the station) and there were four trains leaving Waterloo for Woking between 4 pm and 6 pm. Esher and Walton had two each between these times, and Weybridge three.

The country between Woking and Basingstoke was, in 1871, essentially rural as the sample parishes of Winchfield, Newnham and Basingstoke confirm in the agricultural statistics. Between Woking and Farnborough much land had been taken over by the military. Measom remarked that

nearby Aldershot was a mushroom village, which seemed to be unable to increase its building activity with sufficient rapidity(58). Thus the planting of a military camp had an economic multiplier effect and Aldershot, as well as the other camps, used the railway extensively for the transport of troops and supplies. Measom noted the the enlargement of the Sandhurst military camp. It was a combination of the poor soil, the distance from London as well as the good transport facilities, which helped in the selection of these places for military purposes.

Significant as a land holder between Woking and Brookwood was the London Necropolis and National Mausoleum Company. In 1850, the General Board of Health mentioned the injurious emanations from decomposing human remains in the London cemeteries, and a subsequent Act of Parliament gave the Board of Health power to discontinue internment at most churches in the cities of London and Westminster(59). The Necropolis was one of the first, and certainly the most ambitious, cemeteries to be built along the line of the London and South Western Railway. The company built Brookwood station and ran special cemetery trains from a company owned siding at Waterloo. By 1871 there was a small settlement around Brookwood which had one train leaving Waterloo between 4 pm and 6 pm.

By 1871 Farnborough was established as a small railway town. Measom commented that it was well provided with engines' fuel, force pumps for replenishing the engines, as well as all the requisite appurtanances of an efficient engineering establishment(60). A small core of mid Victorian housing surrounded the station. The Blackwater river was not, however, attractive to settlement, and was left as pastureland. In contrast, by 1871, Basingstoke was an important market town and the population as well as the house numbers, was rising (4654 and 945 in 1861 : 5574 and 1164 in 1871). Measom remarked that the area around was of great fertility and that the town was important for malting barley,

which was sent by goods train to London[61]. Basingstoke was gaining in importance as a centre for making agricultural machinery and had three trains leaving Waterloo between 4 pm and 6 pm showing that long distance commuting had achieved some significance by 1871.

The Impact of the London and South Western Railway on Land Use Change 1838 - 1871

An analysis of the previous descriptive line shows areas of important land use change in the period 1838 - 1871. First the area between Nine Elms and Wandsworth had become almost entirely urban, second the areas between Woking and Farnborough substantially military, since the army had acquired here vast tracts of land. Important textural changes had occurred in agriculture and small towns with stations, along the line, were emerging (and some more successfully than others) as commuting centres.

Unfortunately, the annual reports of the London and South Western Railway for the 1871 have been destroyed and some of the operating evidence is restricted to Committee Minutes[63]. There is no evidence of falling company profits up to 1871, but there is evidence, both from minutes and the annual reports which are available, that the directors were interested in further expansion of the system as well as developing long haul traffic. The Company was concerned with traffic congestion in central London, which it looked upon as a serious inconvenience as well as a factor which might impede further profitable growth. Waterloo station had been opened in 1848, but was still distant from the City and, by 1871, various complicated arrangements had been made with other companies to ensure entry into central London. In terms of the extension of suburban traffic, the directors' efforts were concentrated on middle to outer surburbia, in other words on the affluent and expanding, middle class market. The cautious approach to the inner suburbs can be partially explained by the lack of suitable signalling equipment, as well as to the belief that the working classes did not have sufficient marginal income

to pay the fares. In August 1871, the 'Block' system of signalling was introduced from Waterloo to Basingstoke, and the Chairman announced that because of this, the line would be safer, especially in wintertime. There is no doubt, that with the 'Block' system the frequency of services could be increased: an important factor in the inner suburbs where the lines were crowded. Measom estimated that in 1864, Clapham Junction had 800 to 1000 trains per day(64). But these difficulties notwithstanding, additional developments were required in locomotive design, particularly with regard to acceleration, to cope with the inner suburban situation.

By 1871, the London and South Western Railway, in common with other carriers, was involved with the milk trade, and refinements were being made in the carriage of meat and fruit as well as vegetables, which widened the catchment area for these items. But most important of all in 1871 was the shadow of imminent Parliamentary legislation, which rested over middle class inner suburbs: for strong interest groups suggested that these should be redeveloped for working people. In the next forty years the London and South Western Railway and other railway companies were to react to this.

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TABLE 4

1870 AGRICULTURAL STATISTICS SOURCE: PUBLIC RECORD OFFICE. MAF 68 242. MAF 68 261.

1870	Occupiers of Land	FARMS: Less than 5 acres	FARMS: 5 - 20 acres	FARMS: 20 - 50 acres	FARMS: 50 - 100 acres	FARMS: More than 100 acres	ACRES: Wheat	ACRES: Barley	ACRES: Oats	ACRES: Rye	ACRES: Beans	ACRES: Peas	ACRES: Potatoes	ACRES: Turnips	ACRES: Mangolds	
Basingstoke	65	21	20	6	3	11	732	496	519	13	34	67	19	768	33	
Winchfield	13	2	4	2	2	3	190	48	121	1	34	35	38	98	30	
Newnham	20	10	1	2	3	5	240	42	128	-	92	47	2	39	5	
Wimbledon	68	21	31	9	4	3	136	16	46	-	27	15	48	8	51	
Wandsworth	59[a]	10	27	9	5	1	60	9	44	2	2	2	94	5	55	34[e]
Byfleet	38	11	4	6	9	6	206	158	138	16	14	36	15	205	52	68[f]
Pyrford	19	1	6	1	3	6	187	176	41	14	4	65	13	163	83	50[f]
Wisley	11	3	-	2	3	2	72	69	29	6	2	28	26	50	36	9[f]
Walton	104	61	21	16	5	13	446	343	191	49	33	140	83	250	196	18[f] 6[c]
Weybridge	35	5	15	6	2	4	40	34	11	40	-	88	22	47	32	
Woking	83	17	29	13	6	16	706	654	147	78	18	130	108	408	270	
Malden	16	3	4	2	-	7	182	52	39	-	40	11	1	49	26	
Morden	25	7	8	4	3	5	180	39	88	-	13	18	33	18	37	
Clapham	24[b]	18	5	1	-	-	-	-	-	-	-	-	2	-	2	1[h]
Lambeth	45[c]	12	26	3	3	1	8	4	8	2	3	1	3	2	1	
Camberwell	84[d]	29	39	14	1	1	-	2	-	-	7	2	17	2	19	18[e]
Kingston	68	18	32	8	2	8	364	77	164	12	13	-	69	62	107	

a - also 25 who keep livestock but do not occupy land.
b - 13 ditto.
c - 73 ditto.
d - 36 ditto.

e - cabbages
f - carrots
h - swedes

	ACRES						NUMBERS					
	Vetches	Fallow	Rotation grasses for hay this year	Ditto. not this year	Permanent grass for hay this year.	Ditto. not this year	Horses	Dairy Cattle	Other Cattle	Sheep	Lambs	Pigs
Basingstoke	149	-	742	130	320	184	156	102	45	2749	1361	533
Winchfield	26	50	81	22	201	109	46	22	36	100	-	117
Newnham	18	87	63	14	110	39	63	34	50	44	61	288
Wimbledon	16	39	6	-	421	614	70	261	82	68	32	176
Wandsworth	15	7	7	2	353	288	89	310	120	617	274	288
Byfleet	17	214	71	4	223	311	71	82	99	22	3	241
Pyrford	-	-	76	16	239	199	71	115	207	15	2	164
Wisley	10	12	24	8	152	162	38	144	54	123	20	39
Walton	34	42	218	67	498	971	173	245	223	872	149	585
Weybridge	-	1	15	5	252	361	38	79	39	239	132	149
Woking	2	81	357	36	812	673	303	426	130	701	45	803
Malden	43	32	155	-	437	305	73	59	24	285	13	40
Morden	24	20	55	22	585	281	66	94	67	422	203	96
Clapham	-	-	10	6	32	82	14	172	6	8	5	62
Lambeth	5	4	10	2	142	411	120	918	45	130	36	108
Camberwell	8	-	-	7	389	534	99	499	76	122	56	293
Kingston	67	35	144	95	591	507	158	310	177	617	274	288

CHAPTER 5

LAND USE ALONG THE LINE IN 1911

Economic Background to Land Use Change 1871 - 1911

Ashworth (1960)makes the observation that, by 1890, the most onerous stage of investment in industrialisation in Great Britain was over. The railway system, the docks and harbour works and the towns associated with industrialisation had, for the most part, been built. Capital, therefore, was released for town enlargements and improvement.(1)

This change in investment emphasis during the period 1871 - 1911, was combined, often in unequal proportions, with a variety of other factors. The period was, for instance, another of sustained growth in the population (England and Wales 22.789m in 1871 : 36.136m in 1911)(2), as well as being one of substantial increase in the national income. It was, according to Ashworth, the middle classes who increased their income disproportionately (as indeed they had done in the period 1838 - 1871) but an important feature was the relative growth of the middle class population. By the turn of the century there was an advance of upper level wage earners, both in terms of real incomes and actual numbers, and the growth of these middle and upper wage earning classes had important spatial repercussions as well as stimulating the consumer goods industry(3). An important proportion of the capital available was invested overseas, and by the eighteen nineties, Britain was involved in a total world market, especially develpping areas of land overseas as producers of primary agricultural products. which competed vigourously with home products, often dubdued them and, aided by the application of transport innovation, released land at home for alternative, non agricultural, uses. In social terms, from 1871, there was a growing concern about working class housing, particularly in respect of health and overcrowding, which was illustrated vividly by poor nutrition and disease. A partial remedy

was population dispersal, which was achieved by an injection of capital and by contributions from communications and building technology.

In the central areas of cities economic pressures such as high rent, high taxes and especially high wages were tending to disperse activities which could not sustain these circumatances and, in particular, make these areas increasingly less desirable for residence(4). Kellett (1969) makes the point that by the end of the eighteen sixties the railways had made their main physical impact upon the heart of the Victorian city and that, after this time, there was only a readjustment in the texture of railway land use(5). By 1911, railways had, however, contributed to economic pressure on land use by the presence of sidings, locomotive sheds and other repair facilites. These features often provided growth points for small zones of dereliction and were a powerful incentive for those activities of people who were able and willing to disperse. By 1900 Kellett estimated that of the central areas of British cities the proportions utilised by railway activities ranged from 5.3% in Birmingham to 9.0% in Liverpool. London's proportion was 5.4%. Areas of concentrated railway activity caused a significant land hunger. Thus the central area of London during the period 1871 - 1911 enjoyed substantial textural changes in land utilisation, which can be summarised as giving greater emphasis to select activities which could tolerate high rents, whilst others were dispersed centrifugally. Martin (1966) mentions the movement ouf of the nuisance industries (those producing noxious smoke and grime) as a result of the Public Health Act of 1875(6). Some of these moved away to areas where the law was less vigourously enforced, such as the Wandle valley, Kellett stresses too the importance of the vertical component, especially around the larger stations, where hotels and high buildings used for the reception and storage of goods predominated(7). Olsen (1976) emphasises the erection of office blocks during this period which had obvious commuting and spatial implications for the suburbs, and a variety of authorities comment on the further growth of departmental stores such as

the Army and Navy (1871)[8]. By 1900 the central area of London had acquired extensive newspaper production facilities and relied on railways for national distribution. Hall (1973) remarks on the industries using a central location for what he calls 'prompt execution' (dresses, suits, etc.). Additionally he remarked upon the dispersal of some other activities to suburban locations where demand was local and increasing, such as baking and brewing[9]. For other industries the advantage of a maximum sales location was becoming less pronounced as costs rose and space became scarcer and there was, by 1900, a removal of some industries to lower rent sites in such areas as the Midlands where rents were lower but markets quite substantial and growing. Thus least cost, as well as maximum sales were economic elements in tempering the land use of the Edwardian city.[10]

These changes in economic emphasis were reflected in population distribution within cities. The general report of the 1911 census remarked that the period 1901 - 1911 had witnessed the decline in the growth of great towns. It noted that saturation point had been reached in many central and inner city areas and that urban boundaries needed adjustment to cope with the new situation[11]. Movement of population out of these areas had been helped by transport innovation and improvement as well as by housing policies and the impact of higher site values which have been discussed previously. The impact of an injection of Parliamentary incentive, particularly in respect of the opportunities this provided the railways for population dispersal, was, however, by far the most potent of these features.[12]

By 1871 further concern was being shown in Parliament about the insanitary areas of the inner city, and it was suggested that either heights of buildings were raised in insanitary areas or modern inventions were used to disperse the dense population there[13]. In the area of study notorious slums had developed in Lambeth and Kennington and have

been studied in depth by Binford (1967)[14]. Yet there appear to have been formidable obstacles to high building. Much of the inner city was leasehold and ground landlords were often unwilling to agree to such developments, the Church of England, in particular, feared that high buildings would dwarf churches as they had done in New York. It was doubtful too, and certainly until the eighteen nineties, whether bricks could be produced either in sufficient quantity or in the quality to sustain such erections[15]. In opposition to the concept of dispersal workers were often reluctant to migrate to the suburbs. In addition to the factors listed in the first section of the thesis Dyos (1953) mentions the expense of meals away from home, the loss of friends, the lack of amusements, the expensive foodstuffs (especially fish) as disincentives to further suburban migration[16]. Thus a norm for building height appeared of five or six stories which was palpably insufficient. Parliamentary incentive for suburban migration was provided by the Cheap Trains Act of 1883, which relieved the railway companies of passenger duty on certain journeys, and was deisgned to encourage further the migration of working classes to the suburbs[17]. The London and South Western Railway reacted swiftly to this incentive although contemporary committee minutes and annual reports give no reason why. In 1883 for instance, the company was operating twelve workman's trains and, by 1892, was issuing workman's tickets from thirty two stations, the furthest from London along the line of study being Weybridge[18]. A year later the company issued 1.92m workman's tickets, second in number to the London Brighton and South Coast Railway which issued 2.15m. The London and South Western appeared to be interested in middle, as well as working, class dispersal, allowing workman's fares on journeys arriving at London as late as 8 a.m., an innovation followed by no other company[19]. These concessions and the Company's initiative notwithstanding, the London County Council report on the inadequacy of Workman's Train Services on the South London Railways

mentioned workers settling in overcrowded conditions around Vauxhall, Queen's Road, Battersea and Clapham, because fares were still too high in relation to wages and it was impossible for workers to live further out. There is no doubt too that the contemporary British workman's fares were higher than corresponding fares on the continent as Sinzheimer (1900)[20] had demonstrated and that British cities developed steeper exponential density gradients of population density than, for instance, Berlin. Nor was there any evidence that the rents charged in the distant suburbs were so much lower than those in the inner city that they would nullify the expenditure on high fares[21]. By 1908 a Board of Trade Report on the cost of living for the working classes put the cost of living in suburban south west London at an index figure of 99 compared with 100 in central London and recommended that workman's fares should be very low. The London and South Western Railway annual reports from 1907 to 1911 question, however, the economic viability of short haul suburban traffic and there is evidence that losses sustained here caused shareholders displeasure[22]. There seems, from the annual reports, that the Company did as much as it could, in economic terms, to react positively to a social situation which was not directly of its creation.

If the railway companies were unable to make a significant contribution to population dispersal, such dispersal as occurred during the period must have been due, in large part, to the only other remaining transport agency, the tram. Electrification of horse drawn routes started in earnest at the turn of the century, after the successful technological and commercial efforts in the United States of J. Sprague[23]. By 1899 the London County Council had obtained control of most of the inner London tramways and started immediate electrification projects. Outside this central area, control was held by a variety of individual operators and, in the area of study, a Clifton Robinson operated electric trams from Twickenham to Kingston and Hampton Court as well as to the Dittons, Wimbledon and

Tooting[24]. These tramways had an immediate effect on property and ribbon development occurred along the routes where there was also an element of infilling and backfilling. The resulting housing densities were high and normally between twenty and thirty houses per acre causing large property owners to fear for the decline of the areas in question. There is evidence that the success of the electric tramway, in combination with the low Bank Rate which existed at the turn of the century and aided by the recent advances in building methods, was a disincentive to further capital investment both in and by railway companies. As the continuous growth in railway profits and dividends began to falter more and more people (including working people) invested in residential property, which they found to be a safe, as well as profitable, depository for their savings.[25]

As an attempt to try to keep their share of the commuting market as well as trying to boost their profits, some railway companies extended workman's tickets to the more distant suburbs where rents were substantially lower[26]. Evidence presented to the Royal Commission on London's Traffic in 1903 remarked that the average rent per room in the inner city was 3/3½d per week and on the outskirts 2/4½d. The same commission commented that the major contribution to population dispersal was made by railways on the suburban outskirts.[27]

If transport was partially inhibited by economic forces in its efforts to disperse population some economic incentive was forthcoming from the enabling agency of agriculture. The last quarter of the nineteenth century was known as the 'Great Depression' and was characterised by falling agricultural prices, more numerous agricultural bankruptcies, lower rents and untenanted farms[28]. The background to the depression was complex, but there is no doubt that transport innovation played its part. In the late eighteen seventies, for instance, there were a series of disastrous cold, wet years. In the past, in such conditions, prices had risen: now they fell, primarily because foreigners were able to compete in the

British market. Abroad conditions were often favourable. In the United States for instance, a period of stability had followed the Civil War and the middle continent was being opened up by railway companies[29]. At the eastern seaboard of the United States steam power had superseded sail, with startling reductions in transport costs[30]. Bulk grain for instance, left New York for Liverpool in 1860 and cost 1/1½d. per bushel to transport. In 1886, under steam, it cost 2½d. Grain imports to Great Britain were 30m. cwt. in 1870 and 70m. cwt. in 1900, by which time the Prairies, Argentina and Australia had been opened up. Grain prices had fallen from 55/± per quarter in 1870 - 1874 to 28/- per quarter in 1895 - 1899[31]. Nor was competition restricted to grain. Improvements in refrigeration and transportation techniques allowed frozen, imported meat to compete successfully in the British market. The import of store cattle, which were potentially very cheap, was restricted to Canada[32]. By the eighteen nineties butter imports, particularly from New Zealand, were substantial.

By 1881 a Royal Commission on agriculture was established and identified subsequently the various components of the depression[33]. Two items signified the importance of indigenous transport and the economic impact of cities. There was very little evidence of serious distress around the large towns and the commission recognised the contribution made by railway companies to smallholdings with the building of railway cottages and allotment gardens by the side of the tracks. The commission believed that the general provision of allotment gardens would alleviate agricultural distress[34]. Around the large towns there was still a concentration on dairy farming, but market gardening prospered when the conditions were right and the strong urban demand for cereals for horse fodder continued unabated[35]. Horse numbers had continued to rise during the period (1.093m. in 1870 and 1.399m. in 1914) partly from increasing numbers at work in the cities and partly from increasing military demands. In

general, those areas which could produce agricultural commodities which were required by town dwellers, and were capable of resisting foreign competition, prospered and were helped, as Pratt has shown, by the developing transport system(36). These areas were, especially, sited around London. Hall, however, remarks that the areas of prosperity were small and concentrated, leaving large areas of poorer or unsuitable soil (particularly clay) which were available at cheap rates to property developers(37). In Surrey this trend was partly offset by the large number of gentlemen farmers and rich owners who kept just a few cattle on their land. The Victoria County History noted the concomitant growth of coppice plantations as well as the general tendency to turn the county to grass(38). In North Hampshire rents fell during the depression by about half, but the outstanding fertility of the area around Basingstoke was still an important feature.

The results of population growth and the partial opportunities for population relocation, which were very limited for the poorer classes, can be summarised in spatial terms. The Central Area (here defined as the area delimited by the London terminii) was by 1911, an area of consistent residential replacement by offices, warehouses and other business premises(39). The 1901 census, however, gives greater details of population growth and movement in London than does that of 1911 and includes a retrospective review of population growth and movement in the area of study since 1871.(40)

By 1901 the 'Outer Ring' suburbs included South Lambeth, Battersea, Wandsworth and Camberwell in the area of study(41). It was in this 'Outer Ring' that by 1901, massive population growth had taken place(42). It had started early and between 1861 and 1871 had been focussed especially on Battersea which listed then an increase of 174.6% and was followed by Hammersmith with only 74.1%. In the period 1871 - 1881 Stoke Newington led with an increase of 114.2% and was followed by Battersea with 98.6% and then Chelsea with 83.7%. In the period 1881 - 1891 Fulham took the

lead with an increase of 114.0% followed by Wandsworth with 50.7%, and from 1891 - 1901 Fulham lead again the rate of increase being reduced to 49.6% and was closely followed by Wandsworth with 49.2%. The 1901 census itself reported that the overflow of metropolitan population had now extended beyond Greater London. In spite of this, within the inner city, and extending into the 'Outer Ring' suburbs (especially into the older property) there was evidence of substantial overcrowding. In 1901 the national leader for overcrowding was Devonport averaging 8.85 people per inhabited house (and there were exceptional circumstances for this figure) but of the major cities London led with 7.93 and was followed by Liverpool with 5.55 and Nottingham with 4.57(43). The figures for Liverpool and Nottingham were characteristic of the major British cities of the period and their figures, in line with the national trend, had fallen slightly from the figures of 1891. But London's figures had risen slightly from 7.73 a decade earlier, in spite of the rise in living standards reported during this period. The 1901 census focussed, too, on overcrowded tenements stating that the proportion of these was fifty per cent higher in the urban than in the rural districts(44). Earlier 'Building News' had reported that the subletting of houses designed for one family had reached alarming proportions and that, in the Central Metropolitan area, all the older property was sublet because the heavy rent was prohibitive of single family occupation(45). Although the pamphleteer Low had, by 1904, maintained that the working man was now able to live in the suburbs, not because he had more wages but because he had more time, the opportunities for living out a substantial distance were still frustrated by the long working hours and by the difficulties of rapid transit across central London(46). If the densities of provincial cities were lower, then the vast population size and the relative scale of London has to be remembered in this context. Nevertheless, if Low's hypothesis was correct, the emergence of the underground system by the

turn of the century and, in the area of study, the building of the Waterloo and City Railway in 1893 (in which, initially the London and South Western had a substantial interest) will have been enabling agencies for further population diffusion(47). In fact, the Waterloo and City, five years after its opening, was carrying 3.5m passengers annually and was comfortably exceeding the passenger carrying expectations of the promoters. The impact of these improvements in terms of passenger mobility into the central area is of great significance in the area of study.

Land Use in the Area of Study 1911

Contemporary Ordnance Survey maps show a completely built up area from Nine Elms until the Wandle valley was reached(48). Agricultural Statistics for the metropolitan area show, in 1911, that agricultural activity here had been all but eliminated. In 1871 only the northern part of this area had been continuously built up and the census figures thereafter show a marked rise of population in the southern zone as well as an evening off (and even, in some localtities, a decline) in the northern components(49).

	1881	1891	1901	1911
Battersea	107,262	149,987	168,907	167,743
(Lambeth)	253,699	280,029	301,895	298,053
(Camberwell)	186,593	229,109	259,339	261,328
Wandsworth	NF	47,913	231,922	311,360

The high occupancy rate of buildings in inner London has been noted already and there is no doubt that, by 1881, much of the area between Clapham and Wandsworth was of a poor character. Clarke (1881) mentioned infilling and that the early mansions were being pulled down and replaced with modern villa residences(50). He commented on the further drainage of the marshland (a good indicator of land shortage because of the expense involved in drainage) on this occasion north west of Nine Elms which was itself built on a marsh, in the direction of the Oval. That residential property developers were prepared to contemplate

the drainage of marshland was a very good indicator of the rents they could enjoy. The tangle of railways beyond Clapham Junction itself was, at this time, a lively commercial and residential area and Clarke mentioned the importance of railway services to the City, here provided jointly by the London and South Western and the Chatham and Dover(51). The poor communications to town from Lavender Hill (in north Wandsworth) had inhibited residential and commercial growth there and Clarke saw signs of the area developing with property of poor character. Clarke's empirical observations although early, give a clue as to what was to follow and attempted to relate property type and commercial development to transport facility. In this area of Clapham and north Wandsworth there appeared to be a degree of correlation in this respect. Here too, good property and successful commercial enterprises accorded with superior transport facility.

By 1881 Clarke had mentioned dereliction as well as the inexorable extension south and commented on the complete infilling of main roads by this movement. The spasmodic line of cottages along the Wandsworth Road, for instance, were completely overshadowed by newer larger properties(52).

By 1911 the various housing and street improvement Acts were beginning to make an impact in this area. As street improvements progressed the displaced people, who had held employment previously in a district, had to be rehoused within a mile of their previous residences(53). This regulation placed additional pressure on land and aided attempts to build high. Again interest groups resisted these attempts and a limit was placed of above five stories(54). At this height construction costs could be recouped in about sixty years. By 1911 too there was an element of municipal building in this area, following the passing of the Housing of the Working Classes Act of 1890, which gave local authorities powers to deal with unhealthy areas by erecting new houses and acquiring land by compulsory purchase. In this respect the London County Council was an active local authority in comparison with others, but the property it

built was of the five storey limit. Observations in 'Building News' of other contemporary local authority estates confirm population densities within them of 180 - 190 persons per acre(55).

The concentration of population in this northern area was assisted by the fact that up to 1912, the geographical limit of the 2d. return fare to London was Clapham Junction. (At that time 2d. return tickets accounted for 40% of the workman's tickets issued). In 1912 Earlsfield was the limit of the 4d. return. (4d. returns accounted for 35% of the workman's tickets issued) and Earlsfield was becoming an area of newer, yet concentrated housing(56). Committee minutes of the London and South Western show that the company was, at this time, attempting to induce developments further down the line. Numerous important industries had emerged in this area of population concentration. Price's candle works, for instance, situated at Battersea, was described as one of the largest works in South London(57). At the northern limit of the area of study was Brand's meat extract works and there is evidence that food manufacturing industries had moved out of London with the growth and dispersal of population(58). By 1911, Nine Elms itself had acquired a chemical works, whilst the industries of the lower Wandle, dominated by Messrs. Young & Co.'s brewery, flourished(59). The growth of industry generally in this area is a topic of comment for the Victoria County History, but the part played by the railway in industrial growth and dispersal is hard to assess. There is no doubt that a potent factor in industrial movement away from the centre of London was that of high rents. And the fact that demand was local and labour available, important. Nevertheless the railway was significant for the provision of raw materials and the distribution of some finished products to distant places.

South of Wandsworth the Battersea New Cemetery occupied a considerable tract of land and was sited here as a response to the prohibition of burials in the central area of London as well as to the growth of population in

the suburbs. By 1911 the Wandle itself was the first break in continuous settlement, but it was being subjected to incursions of industrial development, from the north at Wandswotth and in the south from Mitcham. The Flood Plain Gravels away from the river itself were being used for the new carriage sheds of the London and South Western and partly for the track of the new East Putney branch of the system. On the east side of the river considerable land was taken for yet another cemetery.

Wimbledon itself had grown significantly since 1871 (population 9087 in 1871: 41568 in 1911) and the bulk of the building activity had taken place here since 1891 when the population was only 256,671. The area south of the station had grown considerably, newer middle class property was developing along the side of the railway line up to a mile from the station. The tramroute which here ran parallel to the line, had provided additional incentive for building activity and it stimulated construction along, for instance, the Worple Road. By 1907 sharp zones of residential differentiation could be noted in Wimbledon. The 'Homeland Association' stressed the exclusive 'High Side' (to the north west of the station) and the distinct lower middle to working class area was found especially south of the railway[60]. Along the tram route property was distinctly lower middle class, away from the route it again deteriorated unless it was on rising ground. By 1910 nine trains left Waterloo for Wimbledon between 4 pm and 6 pm and there were additional services from Ludgate Hill and on the District Railway, all demonstrating the importance of Wimbledon as a residential suburb[61]. Little agricultural activity was reported in the Agricultural Statistics for 1910. Between Wimbledon and Raynes Park developed a line of discontinuous ribbon development of residential property on both sides of the railway line, more pronounced to the north west where the combination of slightly higher land and access to the tramroute exerted its influence. Small pockets of terraced housing had recently emerged away from the main lines of

communication on both sides of the railway line. Between Raynes Park and Coombe and Malden continuous farmland existed and the importance of farming in Malden can be judged from the Agricultural Statistics. Assiduous attempts were being made by 1911 to develop New Malden, particularly on the easier building land of the Taplow Terrace north of the railway station. The 'Homeland Association' described New Malden as 'a convenient and rapidly growing residential suburb'(62). Houses could be bought for £430 and rented for £27 annually near the station. The rates were low and the rents quoted were 10% less than those in Wimbledon. To compete with the trams and perhaps too generate more traffic, the London and South Western had introduced Workman's Tickets. Between 1901 and 1911 the population of New Malden had doubled from 6233 to 12,137 and eight trains left Waterloo for Coombe and Malden between 4 pm and 6 pm daily. Additionally the railway between Coombe and Malden and Kingston was attracting residential development and the discontinuity there being explained by the very badly drained sections. Norbiton, it was noted, was attracting modern residences of the very best class a short distance from the railway station.(63)

The Hogsmill valley, crossed by the railway midway between Coombe and Malden and Surbiton, existed still as pasture land and farmland, where in fact, extended to within a mile of Surbiton station. Surbiton's population had grown from 12,176 in 1891 to 15,017 in 1901 and 17,717 in 1911, reflecting an extension of residential development centered particularly on the middle classes. Low density housing prevailed. The 'Homeland Association' described Surbiton as 'a prosperous residential neighbourhood - good for the business man'. Eleven trains left Waterloo for Surbiton between 4 pm and 6 pm reaching Surbiton in twenty minutes. At Surbiton, a shopping area of moderate size had grown up on the north west of the railway and, on the same side, small service industries existed, both giving an indication of the prosperity of the inhabitants

as well as illustrating the economic multiplier effect of suburbanisation. The bulk of the residential development of Surbiton was to the north of the railway where the Brickearth provided easy building land as well as, occasionally, some of the building materials, but the chief attractive element here was the river less than a mile from the station, a site enhanced by the Royal Park on the opposite bank, in which no building land was allowed. Discontinuous, middle class settlement existed here for up to two miles from the station, interrupted only by the waterworks which had grown up since 1871 and was one of many to appear on the middle Thames as a result of the growth of London and the directives of the Public Health Act.

Esher's population had increased from 9489 in 1901 to 12,518 in 1911. Here the great bulk of the settlement was south of the railway and some distance from it. Property in Esher was expensive and the town described as 'an attractive place with a beautiful common'(64). The common extended right up to the station and was certain an influence in the exclusive development of the town. Two trains left Waterloo for Esher between 4 pm and 6 pm, but the town had forty trains daily to and from London. North of the railway at Esher the Mole river system was still a deterrent to settlement, but the warm, accessible soils attractive to intensive cultivation. The agricultural significance of Walton is apparent from the Agricultural Statistics. Here a large number of smallholdings persisted, the railway assisting produce to reach London. Walton itself was described as straggling: a good indication that it was not yet an important commuter settlement, and the New Road contained villa residences which were advertised as appropriate for people moving out of London. There is evidence again (and the same pattern is repeated for Weybridge) or urban development being concentrated up to about a mile from the railway station. At Walton this was distinctly lower middle class and at Weybridge there was a concentration on lower density, higher value, property. There seems to be little

doubt that the London and South Western Railway was making a conscious effort to develop Weybridge. By 1911, Walton had a significantly higher population than Weybridge (12,856 to 6,286) but Weybridge had increased more rapidly since 1901 (5,329: Walton 10,329) showing the interest and impact of property developers. The significance of high priced low density residential property is again demonstrated by contemporary developments in West Byfleet where the 'Farm Estate', with houses with five to ten bedrooms, and priced between £3,000 and £5,000 was being promoted(65). Residential growth around Byfleet station, opened in 1877, had been slow and select.

Woking had, by 1911, grown significantly around the station, particularly to the south where the land, previously owned by George Rastrick, had been released for building. The rural amenities, such as the lanes and quiet roads were appreciated by the bycyclist (a growing middle class hobby) according to one contemporary account(66). Such features were used as selling points in literature designed to induce people to move away from London. At Woking these various amenities were reinforced by the fast and frequent train service. Eight trains left Waterloo for Woking between 4 pm and 6 pm in 1910, the fastest taking thirty seven minutes for the journey. The 'Homeland Association' mentioned the growth of low density housing set amidst pines,(67) and other contemporary guides list a large number of private schools as well as the growth of plant nurseries of all descriptions, both giving an indication of the nature of the inhabitants. Thus the belt from Weybridge to Woking consisted of discontinuous developments of low density housing, predominantly for people with above average incomes and accompanied by a variety of ancilliary amenities. Generally the stations had fast trains to Waterloo during commuting hours, often the inhabitants were shareholders who voiced their complaints and interests at annual general meetings of the company, but the whole package of promoting the railway, the newly built housing, as

well as the developing amenities, was skillfully promoted by the railway company in combination with other agencies. In the case of Woking the success can be measured in terms of the population growth of the town: 18,349 in 1901, 24,808 in 1911. This growth, however, did not subdue the agricultural importance of the area, but changed the texture, stimulating the growth of cereals for the London market as well as the provision of fresh milk for the local inhabitants, as can be seen, partially, from the Agricultural Statistics.

Beyond Woking only a limited interest was taken in London commuters in 1911. Farnborough, Winchfield and Hook had but one train each from Waterloo between 4 pm and 6 pm daily ; in 1910. Basingstoke had three reflecting its greater size and importance. The London and South Western Railway Guide mentioned that Basingstoke had sixty up and down trains daily to Waterloo whilst the 'Homefinder' described Winchfield as 'ready for building'.(68) Hook had an estate described as 'now well developed'. Farnborough and Fleet were developing around their stations: Farnborough, particularly, because of the local interest in military activities. In all these locations (as in the areas between Weybridge and Surbiton) fresh milk and vegetables were mentioned in the advertisements.(69

The Impact of the London and South Western Railway on Land Use Change 1871 - 1911

By 1911 there were three distinct zones on the line in which differing aspects of transport had made an impact. The 'Outer Ring' (so described in the 1901 census) extended, in the area of study, as far as New Malden. There is no doubt that the 'Outer Ring' was an area of economic concern for the London and South Western Railway particularly as the age of expansion for the company was virtually at an end. The company could focus no longer on new schemes in distant places either to appease or distract shareholders, at annual general meetings. Within the 'Outer Ring' the railway company had consistently and disturbingly reported falling

revenue as well as decreasing passenger traffic as a result of the activities of other transport agencies with which the company was quite unable to compete. In 1907 the loss of inner city traffic to the bus and the underground was reported. In 1908 a general loss of traffic within the area twelve miles from Waterloo was blamed extensively on the tram and may explain the determined efforts of the company to gain traffic at New Malden at this time. In 1909 a decline in passenger traffic was reported from Vauxhall, Queen's Road, Clapham Junction, Richmond, Kingston, Wimbledon and Hampton Court stations, all these being areas where trams had made an impact. By 1909 the company estimated that it was losing about £70,000 annually, from traffic deficiencies in this area, which was the equivalent of ½% off the dividend(70). Dyos has demonstrated that the company had been dilatory in developing suburban cheap fares (and therefore from having an earlier impact on land use change in this area,) and eventually having to be coerced into introducing them by Parliamentary legislation. Nevertheless these criticisms detract from the contribution made by the company to population dispersal during this period. The four to give storied contemporary houses, which still exist at Earlsfield for instance, are a testimony to the company's response to the Cheap Fares Act as well as to the limits on mobility imposed by the working hours of the time.

In the second zone, which extended from Surbiton to Woking, the impact of the London and South Western railway during the period was substantial. Away from the railway line itself (and indeed further down the line) rural population was falling due to a combination of the agricultural depression, an advance in farm mechanisation and the opportunities of workers to seek jobs, with higher wages, in the towns. Wisley's population, for instance, fell from 157 in 1901 to 140 in 1911. In this zone, often in combination with property companies, the company encouraged middle class settlement and the commuter traffic thus generated

to London was extremely profitable for the company. The movement of people and the important economic multiplier effect it generated, is demonstrated crudely in population increase in rural areas near to the railway, against the national trend, but also in important textural changes in land use, slight in agriculture, but significant in the appearance, for instance, of service industries.

In the third zone, beginning beyond Woking, the impact of the railway in the period was less pronounced. The villages had declined slightly in population: Newnham from 643 in 1901 to 577 in 1911: Winchfield from 487 to 466 in the same period. Basingstoke had increased its population from 9,793 to 11,540 reflecting the prosperity of its market function as well as the increase in its agricultural industries. The distribution of its products was assisted by the London and South Western Railway. Contemporary accounts suggest, however, that this area from Woking to Basingstoke was, in 1911, about to enjoy changes in land use in which the railway company would play a substantial part.

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24. Ibid p. 34.
25. Ibid p. 35.
26. Ibid p. 97.

27. Ibid p. 98.

28. P.J. Perry. 'British Agriculture 1875 - 1914'. Methuen London 1973. p. xi.

29. Ibid p. xiv.

30. Ashworth op. cit. p. 25.

31. Perry op. cit. p. xiii

32. Ibid p. xvii.

33. Ibid p. xxi.

34. Sir J. Clapham. 'Economic History of Modern Britain'. Volume III (1850 - 1886). Cambridge U.P. 1952. p. 288.

35. Discussed in the first section of the thesis. This point is developed in E.A. Pratt 'The Transition in Agriculture'. John Murray London 1906.

36. Ibid passim.

37. Hall in Darby op. cit. p. 688.

38. 'The Victoria County History of Surrey.' Volume IV. John Street London 1905. p. 461.

39. 1911 Census op. cit. p. 42.

40. General Report of the 1901 Census. H.M.S.O. 1903.

41. Ibid. p. 31.

42. Ibid. p. 31.

43. Ibid. p. 38.

44. Ibid p. 42.

45. 'Building News' 1890 p. 334 (LVII)

46. S. Low. 'The Increase of the Suburbs'. T. Fisher Unwin. London 1904. p. 21.

47. Barker and Robbins op. cit. p. 50.

48. The nearest Ordnance Survey maps in age to 1911 are the 1:63,360 of 1912. Sheets 114 115 and 116 cover the area in question. They are not all available for photocopy because of their condition.

49. Census figures are taken from the appropriate census material. Because of boundary changes inappropriate figures have been omitted.

50. W.S. Clarke. 'The Suburban Homes of London'. Chatto and Windus 1881. London. p. 315.

51. Ibid p. 320.

52. Ibid p. 315.

53. 'Building News' February 1911 p. 233.

54. Ibid p. 233.

55. Ibid p. 233 ff.

56. Dyos op. cit. p. 17.

57. V.C.H. Surrey. op. cit. p. 260.

58. Ibid p. 302.

59. Based on records at Messrs. Young & Co.'s brewery.

60. Homeland Association 'Where to Live Around London South of the Thames'. Homeland Association London 1912 p. 192.

61. These, and subsequent figures are taken from Bradshaw's 1910 Railway Guide in David and Charles reprint. David and Charles Newton Abbott 1973.

62. Homeland Association op. cit. p. 120.

63. Ibid p. 104.

64. Ibid p. 80.

65. London and South Western Railway Miscellaneous Guides 1898 - 1910. p. viii. These are available in British Transport Historic Records and appear to have been published by the 'Homeland Association' for the railway company.

66. J.R. and S.E. Whiteman 'Victorian Woking'. Surrey Archeological Society Guildford. (undated) p. 22.

67. Homeland Association op. cit. p. xiv.

68. The 'Homefinder'. Here is a section of the London and South Western Railway's Miscellaneous Guides. p. 16.

69. Homeland Association op. cit. passim.

70. Taken from the Annual Reports of the London and South Western Railway available in British Transport Historic Records.

TABLE 5

1911. AGRICULTURAL STATISTICS SOURCE: PUBLIC RECORD OFFICE. MAF 68 2465. MAF 68 2484.

	HOLDINGS				ACRES									
	Less than 5 acres	5 - 50	50 - 300	300 +	Wheat	Barley	Oats	Rye	Beans	Peas	Potatoes	Turnips and Swedes	Mangolds	Cabbage
Kingston	7	4	1	-	-	-	-	-	-	-	-	-	-	-
New Malden	3	8	2	-	8	-	12	2	-	-	13	2	8	5
Worplesdon	32	51	20	-	274	178[a]	390	3	13	12	82	166	204	9
Old Malden	4	4	4	-	-	2	17	-	-	-	1	6	22	2
Morden	8	6	7	-	51	-	70	2	-	-	3	7	34	1
Wimbledon	9	17	2	-	-	-	-	-	-	-	1	-	6	11
Woking	18	42	21	-	232	124	302	21	9	18	115	136	179	33
Weybridge	3	13	2	-	-	-	6	-	-	-	3	5	21	11
Byfleet	12	12	8	-	41	13	36	7	4	-	5	16	35	2
Walton	11	32	19	-	163	9	188	1	68	97	164	64	105	66
Newnham	2	13	6	-	115	28	88	2	10	8	1	23	40	6
Winchfield	4	2	8	-	119	81	90	-	18	41	18	40	37	4
Basingstoke	12	26	11	3	359	160	381	20	-	20	15	158	31	6

a = also 30 acres of bere

	ACRES						NUMBERS				
	Vetches	Small fruit etc.	Grass for mowing	Grass for grazing	Permanent grass for mowing	Permanent grass for grazing	Horses	Dairy cattle	Other cattle	Sheep	Pigs
Kingston	-	2	-	-	90	72	10	45	14	72	10
New Malden	6	6	-	-	226	98	25	31	13	-	88
Worplesdon	19	8[b]	270	13	991	840	225	386	425	456	291
Old Malden	2	-	FIGURES NOT AVAILABLE								
Morden	1	-	161	20	321	391	55	142	179	131	58
Wimbledon	1	8	18	10	169	239	58	50	2	1	50
Woking	14	11[c]	149	40	1152	919	258	353	338	652	735
Weybridge	1	-	7	-	157	179	22	135	3	-	107
Byfleet	11	-	46	16	364	285	76	117	109	-	250
Walton	18	-	124	-	795	1051	191	272	92	1208	407
Newnham	28	-	47	-	270	191	59	115	75	-	68
Winchfield	11	-	64	2	274	289	68	101	112	103	82
Basingstoke	117	-	423	-	797	449	137	277	173	1118	153

b = currents + raspberries

c = carrots

CHAPTER 6

LAND USE ALONG THE LINE IN 1938

Economic Background to Land Use Change 1911 - 1938

Glynn and Oxborrow (1976) comment on the essential paradox of Great Britain during this period which was one of a high level of unemployment as well as economic growth[1]. They comment, as well, on the national industrial growth points, stressing the significance of the West Midlands and South East England and highlighting London as the centre of the consumer market. In these areas unemployment was below the national average and Glynn and Oxborrow remark that those who remained in employment enjoyed substantial economic benefits which many translated into greater spatial requirements[2]. In 1936, 13% or 2.13m people in Great Britain were unemployed which represented a decline from the post war peak of 15.3% (2.29m) of 1933. In the South East unemployment was concentrated in the areas of older housing in the inner city which represented only a small section of the Nine Elms to Basingstoke line.[3]

The annual reports of the London Passenger Transport Board give a vivid contemporary account of industrial growth and change in the area of Greater London served by the newly established Board, whose fourth report of 1937 showed the growth of population and manufacturing in Greater London in the period from 1921 to 1936[4]. Insured population had grown from 2.34m in 1931 to 2.60m in 1936, and was accompanied by a substantial growth in manufacturing (from 1.01m to 1.37m) as well as in other activities. The report stressed the growth of factories rather than workshops in the Greater London region. A factory was defined as having power driven machineryand was, by this definition, larger than a workshop. Figures from the Chief Inspector of Factories indicated that, in 1921,

factories amounted to 25,550 in the area and, in 1936 to 39,033, whereas workshops had declined from 60,093 to 57,096 during the same period. The report emphasised the location of new factories along the arterial roads; 470 factories, for instance, were built in the L.P.T.B. area between 1933 and 1936, of which two fifths were in the factory estates built beside arterial roads.

In 1938 the railways were still the national core of the transport system for the land distribution of commodities, particularly heavy goods and minerals[5], but the newer industries of Greater London produced light products with an intricate market orientation well suited to road transport distribution. Additionally these industries exploited the new freedom of location allowed by the general use of electricity provided by the Grid System.

The growth of these successful factories encouraged a migration of population to the South East from the less fortunate areas of the country[6], and those finding employment tended to settle in a scattered, rather than a concentrated pattern[7]. This theme is develpped further by Richardson and Aldcroft (1968), who noted that the new urban areas of the period were either created on the edge of the old suburban ring or in the gaps between the railway based communities which had grown up before the first world war. They quoted Kingston as an example, which they stated was, in 1918, a semi rural community, but which acquired, in the interwar period, a strong industrial base and expanded south to fill the vacant land between it and the London and South Western main line.

The London Passenger Transport Board reports regretted that there was little or no co-ordination of the planning of housing and factory developments in order to reduce the volume of workers' travel[8]. Workers who had moved to the outer districts may still have lived a considerable distance from their place of work. This movement out had been a conscious decision (because housing was cheaper) and workers tended

to try to get to work as cheaply as possible and very high proportions of workman's fares were recorded in the outer suburbs.(9)

By 1935 the Census of Production recorded that Greater London achieved 24.8% of national production and the value of this output was £386.1m. Greater London was the only area, apart from the West Midlands and rural Wales, to record an increase since 1930(10). By 1937, the South East and Eastern area had 30% of the nation's factories according to the Board of Trade Annual Industrial Survey which stressed the movement of population away from the depressed areas to, especially, Greater London.(11)

The area between Nine Elms and Basingstoke was, therefore, part of a region in which there had been considerable industrial growth since 1919. It was an area in which industry had an increasing freedom of location and in which industry had become dispersed rather than concentrated, exploiting new power supplies and transport possibilities and demonstrated an increasing flexibility in acquiring raw materials and distributing finished products. Especially it was an area of population growth which was well above the national average and this population enjoyed incomes above those of the remainder of the country.

Apart from the population growth in the area between Nine Elms and Basingstoke, a feature observed in the 1931 census and later confirmed in 1938 by the Registrar General's figures, was the diminution of population in the administrative area of the Greater London Council and the growth of population in the Greater London area. In 1931 the situation was :-

London County	4.40m	4.84 (1921)
Outer Ring	3.80m	3.00 (1921)
Greater London	8.20m	7.50 (1921)
	8.79m (1939)	(12)

The ability of people to move residence from the central area was partly assisted by the overwhelming competition of industry and commerce there and partly by the very low interest rates of the thirties(13). Marshall (1968) has commented that the low interest rates encouraged the

building of properties for rent as well as for sale in the outer suburbs and thus allowed a wider selection of social classes the possibility of migration(14). Nevertheless the Marley Committee of 1931 had regretted the relatively small amount of privately constructed housing available for rent in the suburbs(15). This report notwithstanding between 1921 and 1931 there was a partial easing of overcrowding in inner London. In Lambeth, for instance there was a small decline in persons per acre (77.4 to 72.5) in this period, and this decline was stimulated further by governmental legislation. The 1924 (Housing Provisions Act) established local authorities as providers of housing for the working classes and many London boroughs had to look outside their boundaries for suitable land(16). The Housing Act of 1930 provided subsidies for slum clearance and the Housing Act of 1935 reacted to the overcrowding figures revealed by the 1931 census by alloting a further government grant for local authority housing(17). This Act was probably a sharp reminder that the 1921 census had noted the inferior condition of housing in London as compared with the other large towns in England and Wales and which, then, had extended to the outer suburbs, for one ward in Wimbledon (Trinity) had over 80 persons per acre in 1921 living in these poor housing conditions.(18)

Both the 1921 and 1931 census reports stress a factor previously mentioned, and develop this as the major contribution to the levelling of the, once steeply slanting, negative exponential population density gradient for London. And this is the decline in family size which was accompanied by the formation of more numerous family units. In London in 1921 there had been an increase of 96,946 families since 1911 with a decline in population. Surrey's families increased by 30,496 in the same period. By 1931 London's families had increased by a further 69,133 and Surrey's by 300,275. The decline in family size was dramatic. In London from 3.79 to 3.46 in the period 1921 to 1931 and in Surrey from

4.07 to 3.67. In 1931 the number of dwellings had grown by 42.1% in Surrey and the number of families by 41.3%. So the census figures partly reflect and confirm the underlying social and economic trends. Those of 1921 and 1931 demonstrate the complex interaction of changes in family size and economic circumstance which are, in turn, tempered by both social and technological pressure.

Thus the boom in the construction of houses and flats was one of the chief features of the economic activity in Great Britain during the thirties, though the fact that the greater part of it was to be seen in London and the Home Counties may have exaggerated its importance. It absorbed at least a quarter, possibly half, of all capital investment(19). Something over 4.5m houses were built in Great Britain between the wars (4.17m in England and Wales) and, of these, over a quarter, in England and Wales, were built by local authorities(20). In the twenties the annual average of house construction was 150,000 and during 1931 and 1932 this rose to 200,000. By 1934 the annual rate had reached 329,000 and remained there until the outbreak of war.

A variety of economic and social conditions favoured house building in the London suburbs. During the 1914 - 1918 war income tax had been increased steeply, but the Building Societies enjoyed a favoured tax position and deposits in them increased as the societies became partial tax havens. By 1932 the interest rates offered by societies were low, but the Wall Street crash of 1929 which had repercussions on the London Stock Exchange, made investments in equities unattractive. As an alternative to government stocks, the Building Societies were able to offer rates giving yields .8% higher. They attracted funds consistently and had, therefore, money available for house buyers. The establishment of branches in the suburbs (a feature pioneered by the Halifax) and the general lengthening of the period of repayment were further features which stimulated growth(21). Additionally, this period is the first when

wage earners, on any great scale, were encouraged to borrow from societies. In 1936 one major society reported that 50.6% of its borrowers were, indeed, wage earners[22]. The Building Societies often encouraged small builders, providing they built to an acceptable specification. By 1930, for instance there were 43,620 building firms with less than ten employees[23], and by 1938 the numbers employed in the building industry reached an all time high of 1.16m.[24]

If the financial climate was favourable for housebuilding it was reinforced by social and other factors. In London there was a boom in building commercial offices as well as a spate of new hotels, and the consequent demolition of residential property which encouraged dispersal of residents[25]. Factory building, in this favoured economic area, was often accompanied by housing developments[26]. Nationally, family size had fallen from an average of 4.35 in 1911 to 3.59 in 1939, whilst the total number of families increased from 3.625m to 6.760m in the same period[27]. Marriage had been delayed during the 1914 - 1918 war and there is evidence that it was delayed again during the depression, and the more space demanding nuclear family had tended to replace the extended family which was common before 1914. By 1938 the annual marriage rate had risen to 403,300 some 50,000 above the 1930 figure[28]. Above all, in the thirties, there was the important factor of taste. There was a social stigma associated with obsolesence, especially with housing, and in areas of higher than average incomes the opportunity cost of investing in a new house tended to prevail.[29]

It is only at the end of the period of study that serious attempts were made by the various planning authorities to ensure that housing development was balanced with industrial office building[30]. Thus, in the area of study, the Restriction of Ribbon Development Act (1938)[31] and the London and Home Counties Green Belt Act (1938) had insufficient time to make any impact. In contrast the 1935 Housing Act, which attacked

overcrowding in cities, providing further stimulus for local authority building outside London. And additional encouragement for housing development in the south London suburbs was indirectly influenced by government grants for railway electrification as well as by a differential rating system, which favoured the suburbs, particularly in factory construction.(32)

In the suburbs two types of location were especially favoured by builders: those near a railway station or those close to or contiguous with an arterial road. The 'Estates Gazette' for 1926 remarked that the opening of stations with a reasonable service of trains caused an almost sudden jump in the value of the adjoining land. The 'adjoining land' was defined as being about half a mile (or ten minutes' walk) from the station. This distance did not call either for 'excessiver exercise' or 'entail expense in further fares'.(23) In suburban expansion initially the established stations were the areas of expansion and when these sites were developed new stations, intermediate between the old, were opened. Those opening after 1920 in the south west suburbs of London all obtained some form of construction subsidy from interested residential developers. And the station building was often accompanied by sidings which were built initially to accommodate the vast supplies of building materials needed for residential development (particularly the bricks which were rarely local) and subsequently to accommodate coal for the new estates.(34)

Dramatic changes had taken place in British farming after the 1914 - 1918 war which were to facilitate land use change, especially in suburban locations. Astor and Rowntree (1939) had noted the new phase of agricultural competition which was more intense than any previous one(35). In the face of this competition, the British farmer had to concentrate on those products in which he enjoyed a naturally sheltered market. The changes in land use had been swift with grass farming often replacing

arable and those farmers who still grew crops and reared stock had, in order to compete with imports, to greatly increase their technical efficiency. This proved to be the only way to remain solvent.

The resulting changes in land use were largely stabilised by the creation of a variety of government based agencies many originating from the Agricultural Marketing Act of 1931[36]. Marketing Boards were created for milk, bacon, potatoes and hops. Of these agencies the Milk Marketing Board, established in 1933 had the greatest impact on land use, for it combined a differential pricing policy (which favoured distant areas) allowing remote areas to compete in the London market for the first time[37]. The result was a further diffusing of dairy activity and the partial release of land surrounding the big cities for alternative use. In greater London the Express Dairy was particularly active in releasing land. The demand for distant milk was encouraged by the pricing concessions granted to State Schools in 1936, but partially offset by complaints of the purity of milk such as the finding of the 1933 L.C.C. Public Health Committee[38]. In Greater London the London Clay was largely abandoned by dairy farmers who found it profitable to move away selling the land for building purposes. By 1937 the dairy herd of Great Britain was 36% more than 1913 and the areas of greatest increase had been the north and north west of England[39]. Stock fattening as well as the cultivation of field crops had declined and other forms of capital intensive farming had become unprofitable because of falling food prices. Activities requiring limited capital flourished particularly on the urban fringe[40]. Here the leader was poultry farming, and the backyard producer, by the early thirties, accounted for nearly half the trade in eggs and poultry meat. Pig farming too required a limited capital and, by using household food waste, as well as skimmed milk, many small-holders could make a living from it especially in the suburbs. Astor and Rowntree noted a relationship with potato growing in the same locations.[41]

There were two additional factors contributing to land use change in rural locations. Technical inventions released men from the land and, by 1936, 40,000 tractors operated and the combine harvester was in general use[42]. In London itself the number of slaughterhouses declined releasing space for other developments. There was a tendency for slaughterhouses to move to rural, provincial locations with stock farming hinterlands the meat then being sent to the capital by refrigerated lorries. Aberdeen had led the way in this respect, the experiments there proved to be financially successful and were quickly copied elsewhere.[43]. And lastly transport changes made an impact on land use change. Nationally, in 1938 the transport scene was characterised by intensive competition for the railways (with occasional bold attempts by them to retaliate) by the growth of road transport both in terms of passengers and freight, by increased personal mobility (which was reflected, particularly, in the rise of private vehicle ownership) and by governmental legislation which tended to temper change. The result was that transport networks were becoming increasingly complicated and even diffuse.

What the transport system sought to achieve in the Greater London area was summarised in evidence submitted on behalf of the London Passenger Transport Board to the Royal Commission on the Geographical Distribution of the Industrial Population[44]. It noted the location of industry in Greater London, the continued proliferation of factories, the higher than average wages in the region (which allowed for a larger potential range of commuting than elsewhere in the country). Industry, the evidence claimed, was especially light industry, increasingly using road transport. The evidence was concerned about congestion in the London Docks where the annual trade, at £467m in 1935 was far higher than the nearest competitor (Liverpool at £272m) and growing[45]. The L.P.T.B. highlighted the problems of providing an adequate transport system during peak hours and, perhaps in the hope of stirring governmental intervention,

stressed the difficulties experienced by electricity generating boards in maintaining power at peak times.(46)

The travel characteristics of the Board's area were demonstrated in the Third Annual Report and Accounts of 1936, when it stated that people were travelling more frequently and that journeys were longer(47). The report stressed the importance of feeder services to main line stations. In 1911, according to their estimates, there had been 1,800m passenger journeys to these stations in the Board's area: by 1935 this had risen to 4,000m. The increase in the rate of local travel had outstripped the rate of increase in population in the outer suburbs. The report commented on the dispersal of industry, of movement out of the centre of London and of the continued separation of home and work-place. It maintained that only by railway could the outer suburbs be provided with adequate transport facilities giving access to the centre(48). The Board was concerned with the rise of car ownership which amounted, in London and the Home Counties, to 426,000 in September 1935 which was an increase of 270,000 (170%) since 1925. A feature of the outer suburbs in the thirties was the growth of cycle ownership a cheap useful addition to the range of the commuter.(49) The Board remarked as well on the fact that, by 1937 30% of the nation's factories were in the South East and that workers were drifting here from the depressed areas elsewhere.

Thus the area between London and Basingstoke was part of a region in which the national changes which impinged upon land use change during the period 1911 - 1938 had been very strongly emphasised. In particular the new found freedom for industrial location had resulted in a strong dispersal and it was a pattern emphasised by above average population growth of inhabitants af above the average national income.

Land Use in the Area of Study 1938

A variety of primary sources contribute to an understanding of the 1938 Land Use Pattern. These include the 1931 Land Utilisation Survey

maps (with the concomitant explanatory handbooks) the 1938 1" Ordnance Survey maps and the 1938 Agricultural Statistics. Additionally, it is possible to identify, by empirical observation, features of the 1938 land use pattern along the line.(50)

The 1931 Land Utilisation Survey for London and Middlesex showed the area between Nine Elms and Clapham to be an area so covered with houses as to be agriculturally unproductive(51). By 1938 the situation had changed little and the area accorded to the 1931 description of an 'old housing area'. The majority of the housing stock was pre 1914 in age with terraced housing predominating on the lower ground especially around Nine Elms. Larger houses, including semi detached Victorian villas, existed on the higher ground away from the railway line to the east, but where then susceptible to multiple occupation. Between 1921 and 1931 the population density in this northern part of the line, had declined, (Battersea from 78 to 73.8 persons per acre; Lambeth 74 to 72.5) and was partially mirrored in the increase of personal space. (Rooms per person increase in Battersea from .96 to .98 but Lambeth declined from .98 to .97 in the same period). Slum clearance had been initiated as a response to the 1930 Housing Acts. The 'Homefinder and Small Property Guide' which advertised new property developments in south west London in 1938 noted no properties for this area. Evidence from contemporary local newspapers shows that these developments were both infrequent and small scale. No major industrial area was shown in this section of the line by Martin (1966) nor was there any particular reaction to new forms of transport noted by field work evidence(52). Industries, in 1938, tended to be small scale, light as well as traditional in character. The predominant industrial activity was the goods yard at Nine Elms itself, which occupied several acres and was accompanied by a large coaling and repair depot. There is no doubt that the Southern Railway was a large employer of working class labour.

The section between Clapham and Wimbledon was also categorised as an 'old housing area' by the Land Utilisation Maps, but this spread was discontinuous. Nevertheless 'old housing' focussed on the railway line: away from it, on either side, were pockets of what the Survey designated 'new housing areas', (i.e. housing built since 1918). Of these, the largest development was east of Earlsfield, where the previously unattractive flood plain of the Wandle had been developed both by the local authority and by private enterprise for residential property. The higher land between Clapham and Earlsfield, which was often smoke and fog free, still retained the large Victorian and Edwardian villas which were characterised by large gardens. No new developments were mentioned in the 'Homefinder' directly by the railway, but substantial developments progressed at Merton and Morden, where semi detached property was priced between £645 and £1095, and there was some infilling of the older property near the railway line by the building of flats and maisonettes(53). The southern limit of this part of the section (south of the River Wandle) revealed many houses in the 'houses with gardens' category of the Land Utilisation Survey. The Wandle Valley itself had a variety of land uses, ranging from watercress beds, a sewage farm and cemeteries on the eastern side, to railway yards and repair sheds to the west of the railway. The sheds contained engine repair facilities as well as service facilities for the new electric rolling stock. Additionally the Wandle valley provided the space for the new railway fly over. No major industrial area is noted by Martin, traditional industries flourished in the lower Wandle dominated again by Messrs. Young & Company's brewery(54). But there is no doubt that railway activities dominated this section of the line. The population of Wandsworth rose from 328,307 in 1921 to 353,110 in 1931 (reflecting the developments in the Wandle Valley) but fell to 340,100 in 1938 as slum clearance activities made their impact. Wimbledon's population fell with movement out of the overcrowded areas

of 'new' Wimbledon. This was partly offset by new residential developments in the borough. The population was 61,418 in 1921, 59, 515 in 1931 and 58,680 in 1938. Both Wimbledon and Wandsworth confirmed the trends exhibited in Clapham and Lambeth in terms of the reduction in overcrowding. Person per room declined in Wandsworth from .84 to .79 during the period 1921 to 1931 and in Wimbledon from 1.30 to .71.

The area between Wimbledon and Surbiton is shown on the Land Utilisation Map to have been an almost continuous 'new housing area'(55). Gaps existed at the Beverley Brook and the Hogsmill River where water control schemes had not yet been initiated and where, in both cases, the land was liable to flood and was not attractive for private building, whilst other land (especially the clay lands) was readily available and comparatively cheap. By 1938 playing fields and the extensions of Carter's Seeds occupied the crossing of the Beverley Brook and the sewage farm, as well as further playing fields, the Hogsmill River. 'Old housing areas' were seen as linear developments along the railway line at both Wimbledon and Surbiton, and as a north south development at New Malden on the attractive dry site of the Taplow Terrace. To the west of the town, the old fish ponds on the badly drained London Clay, had been developed recently for local authority housing. Since 1918, in this section, 'new housing areas' had expanded from the existing stations and Howkins' model had been faithfully fulfilled at Surbiton, New Malden as well as Wimbledon(56). A gap in continuous settlement was found between Surbiton and New Malden and, in 1938, estate developers here had recently contributed 90% of the £6,275 required to build the wooden station at Berrylands midway between these two places(57). The eagerness to exploit the opportunities for residential aemi detached building are recorded in the 'Homefinder' where houses between £635 and £1,800 were being constructed by three major developers. Apart from this large development of houses at Berryland, there were other developments, on a smaller scale, of two types in this

section. First were those developers filling gaps along the railway line and who depended on new stations being built. Just beyond Surbiton at Hinchley Wood, a new island site station had been built in 1930, largely through money acquired from property developers. Here, by 1938, houses ranging in price from £750 to £1,800 were being advertised in the 'Home-finder'. Apart from the railway attractions these advertisements stressed the importance of buses and coaches as a means of getting to 'Town'[59]. Second, other residential developments were filling in land at some distance from the stations, on the margin of the range suggested by Howkins. At New Malden, for instance, houses were offered at between £525 and £1,500 and on the edge of Kingston land was still being offered for sale to developers[60]. In Kingston, houses were advertised at between £785 and £845. Again, at Hampton Court (and some distance from the station) houses were available in the £975 to £1,545 price range. The area between Wimbledon and Surbiton was significant as well for industrial development and the Kingston by Pass was noted as an important industrial area by Martin[61]. Firms connected with the motor industry such as Avery Hardell (1932), Andre Rubber (1936) and Frazer Nash Cars (1931) were sited along it. Other important occupiers were Senior's Foods and Decca Records[62]. All of these factories relied on road transport for the distribution of their goods and the acquisition of most of their raw materials. But especially these firms were market orientated and were situated in the midst of a growth area. Malden's population had grown from 14,495 in 1921 to 23,350 in 1931 and 38,820 in 1938 and Surbiton's from 19,547 to 29,401 and 46,600 in the same periods. By 1931 Surbiton had a density of 9.6 persons per acre and Malden and Coombe 7.3, increases of 60% and 62% respectively over 1921, and showing a marked contrast to the reductions recorded in more northern parts of the transect.

Between Surbiton and Woking 'old housing areas' were centered in

those places where the settlement core was adjacent to the railway. These places had expanded strongly during the interwar period and 'new housing areas' extended up to two miles from the stations, a distance further than Howkins* had hypothesized. The population, in these places, was, traditionally, of above average income and used private cars to commute to the stations. As in the other parts of the transect, rivers and river flood plains still proved to be inhibiting features for residential development. The Mole was used partly for resevoirs and partly for a sewage farm with a residue of smallholdings on the alluvium particularly between Esher and Walton. Farmland and another sewage farm characterised the crossing of the Wey. Of the areas served by the old established railway stations, Esher itself had developed little around its original core, which was some distance from the station. At the station itself there was, as yet, feeble residential development. Much of the land was either common or part of Sandown Park racecourse. Many of the property developments at Esher were for the higher income groups and new houses advertised in 1938 ranged between £1,175 and £2,500. As in the area between Wimbledon and Surbiton, new railway stations were opening in this section of the line. At Hersham, £5,000 of the £9,000 costs was provided by estate developers(63), and both West Weybridge and West Byfleet received financial support from builders(64). The areas around these new stations developed quickly: generally with a low housing density of about eight to the acre. The 'Homefinder' displayed advertisements for developments at Hersham and Walton (both from £750 upwards) whilst the 'Byfleet Review' advertised property between £525 and £600 in that location(65). Building continued apace at Woking and prices, according to advertisements, ranged from £925 to £3,000, the upper end being to client's specifications(66). A similar price range for property existed at Weybridge. Esher, Woking and Weybridge, therefore, had a variety of similar characteristics. In general their property was above the average price for the south western suburbs. It

* See p 112 and ref. 56

was property of a low residential density with grounds of between ¼ and ½ an acre not uncommon[67]. The population densities of these places had increased by between 10% and 20% in the period between 1921 and 1931 and the average number of rooms per person had declined from between 1.4 and 1.5 to between .65 and .7, an useful guide to superior property development. In terms of population growth this was between 17% and 28% in the 1921 - 1931 period, and between 1931 and 1938 the population of Esher increased by a further 249% whereas Woking and Weybridge average a further 15%. This dramatic increase at Esher is due in part to developments on the London Clay and on the Mole distributaries. These three stations enjoyed faster, and often more frequent train services to London, than the newer intermediate locations. Whether this was because of market demand or because of pressure from interest groups is a matter for speculation. Nevertheless, as communities, these areas were able to resist the intrusion of lower priced housing or to divert it to places which were considered appropriate. Often too, golf courses took up large sections of spare land. Surbiton had one, Weybridge two and there were courses at both Byfleet and Woking in 1938.[68]

Industrially, between Surbiton and Woking, the railway was still a large employer of labour in 1938. At Woking the railway was especially important possessing large goods yards as well as repair facilities. But significant new industries were making an impact on this section of the transect. The aircraft industry was, by 1938, well established at Weybridge, using the abandoned Brooklands motor racecourse as its headquarters. Reservoir construction at Esher promised to takeup a great deal of space, whilst, at the same time, releasing land lower down the Thames.

The area between Woking and Basingstoke showed some of the characteristics exhibited in the section between Surbiton and Woking. Both 'old' and 'new' housing areas were situated in the established

towns often with a range for commuters extending beyond the boundaries of Howkins' model. Some of the intermediate stations, although well established, had attracted little commuting development and there were long sections of railway line between stations. There was no attempt to build any intermediate stopping places using the financial facilities of estate developers, and the river valleys such as the Blackwater and Whitewater were not attractive to residential development. At Basingstoke, Newnham, Winchfield and Fleet, the increase in persons per acre during the period 1921 to 1931 was well below that of the section between Surbiton and Woking, ranging between 3% and 16% whilst rooms per person declined in the same period, Basingstoke and Newnham to .77 and .76 and Winchfield and Fleet to .69 and .63. In 1921 the range was 1.13 to 1.43. It seems from this decline that Winchfield and Fleet attracted superior property developments and this is confirmed by observations in the field. Fleet developed rapidly after 1931, the population increasing by 79% (from 4,526 to 8,089) whereas in the other places the rise in the period 1921 to 1931 and from 1931 to 1938 (where figures were available) was much lower, and certainly lower than the immediate northern section of the transect. In all these places new housing developments were not on a sufficient scale to appear in the 'Homefinder', but advertisements for developments appeared in a local newspaper at Farnborough but quoted no prices[69]. Similarly, small scale building work was being carried out at Basingstoke and was advertised locally[70]. A complication in the explanation of the settlement changes in this area was the military base at Aldershot and the extension of military activities between Woking and Farnborough. Much land was acquired for training purposes, especially the infertile sandy tracts, and the area south of the railway at Farnborough included barracks which were an extension of the Aldershot camp. Industrial development was limited and specialised, much being connected with the

military services such as the Royal Aircraft Establishment at Farnborough, whilst Basingstoke itself continued its traditional industries such as the manufacture of traction engines and heavy lorries.

Farming in 1938 is illustrated from select locations by means of the Agricultural Statistics obtained from the Public Record Office. These show that from Nine Elms to Wimbledon there was very little agricultural activity indeed. Small residual areas of orchards existed and the water-cress beds traversing the Wandle valley still persisted. Somewhat larger pockets of agricultural activity persisted in the area between Wimbledon and Surbiton, with numerous small holdings dealing especially with pig raising and market gardening as well as nursery activities. Between Surbiton and Woking these activities were emphasised further and the climax of the nursery belt (in as far as it existed in 1938) was found at Walton where it utilised the alluvial deposits of the Thames and Mole which, over a considerable period, had been fertilised with town manure that had been transported easily along the Thames. On the edge of the area between Woking and Basingstoke, agriculture was more diversified and it can be seen from the Agricultural Statistics that no one activity predominated. The numbers of agricultural workers too was very subdued. It is difficult to produce any definite agricultural belts, whereas it had been relatively simple to do this in 1838, but there is no doubt that, on the periphery of the built up area, agricultural activity accorded with the pattern demonstrated elsewhere in the United Kingdom at that time. That on the urban rural fringe looked to a short term future and was often merely awaiting an attractive offer from an estate developer. In 1938 some of these ambitions had been thwarted by planning legislation and the land use pattern was further fossilised by the advent of war.

The Impact of the London and South Western Railway on Land Use Change 1911 - 1938

The physical impact the railway was able to make in this period was tempered by the commercial requirement of staving off financial losses which appeared in the late nineteen twenties. The remedy for these losses was partly severe economies and partly the concentration of activities (both passenger and freight) on the potentially viable sections of the line.

During this period, the section of the line between Nine Elms and Wimbledon showed a declining economic potential for the company (and for the Southern Railway which resulted from an amalgamation of the London and South Western Railway and other companies). Before 1911 the railway company had complained of falling receipts, declining profits and increased competition in this section and, in the period 1911 - 1938 the position was exacerbated. New forms of competitive transport, such as the bus and the tram had developed technologically and were able to make a stronger commercial impact. These forms were ideally suited to a population who required increasingly, crosstown services (which were especially complex when most of a family unit worked) whereas the railway company's services were predominantly linear. All services were, in fact, competing in a contracting market, for the area was one of pppulation decline, a decline that was particularly marked at the end of the period as the policies of slum clearance under the 1930 Housing Act began to bite. The impact of these adverse factors on the Southern Railway is demonstrated in ticket sales. Those at Clapham Junction, for instance, in terms of ordinary tickets sold, declined by 2,456 in the period December 1934 to December 1935, and workmen's tickets fell by 4,516 in the same year[71]. The railway company continued to be a strong land holding agency and it was in this area where its impact on land use was most potent. The vast engine sheds, goods depot and

repair yards at Nine Elms continued to prosper and the new electric depot between Wimbledon and Earlsfield expanded considerably. Both enterprises were substantial employers of labour.

White (1963) had made the point that the newly formed Southern Railway continued in the traditions of the London and South Western Railway by concentrating on the distant middle class traffic rather than the intensive inner suburban services, and it was in the area beyond Wimbledon where the Southern Railway saw economic possibilities[72]. In 1935 the company was lent £30m at the low annual rate of interest of 2½%, for the creation of jobs by railway improvement[73]. In the area of the line the money was used in the electrification of the London to Portsmouth main line, on suburban station improvements and on numerous track improvements, which enhanced both the speed and frequency of trains. (These included the introduction of electric colour light signalling). Some of these improvements were slanted towards the suburban user. The fly over built between Wimbledon and Earlsfield, aided the turn round of suburban services at Waterloo; electric services were in general use on suburban services by the end of the period; easily memorised timetables were devised in the hope of increasing traffic[74]. Lastly a number of new branch suburban lines were built. In the area of study the line from Motspur Park to Leatherhead (which opened up a large tract of London Clay) was virtually complete by 1938[75]. The company was slow, however, to adapt to the lower middle class market and there were numerous complaints from interest groups of the lack of third class accommodation[76]. Between Wimbledon and Woking during this period the company used converted steam railway carriages which enjoyed dual class accommodation of which one fifth was first class. Local interest groups declared that this was an overprovision. Often these compartments ran empty whilst there was standing in the third class accommodation during the rush hour. Nevertheless the company made great impact in assisting

in land use change in this section of the transect during this period and the growth of new settlements at Berrylands, Hersham and Byfleet is due to the combined enterprise of the railway company and building firms. That the new style services were an aid to growth is shown in contemporary town guides. That for Kingston stated in 1937 that nothing had contributed to the growth and prosperity of the town and neighbourhood as the electrification of the Southern Railway. There were, in 1937, twelve trains an hour between Kingston and Waterloo. The guide remarked too that there were services of trackless trolley cars (the Kingston area had been a pioneer user of the trolley bus) and omnibuses radiating in all directions which brought many country districts into direct connection with the town which was served also, by long distance Green Line coaches(77). The guide for Woking, also for 1937, noted the fast railway services to London, but continued to stress the clear air and aromatic pines, maintaining that Woking was, in fact, an inland Bournemouth. The guide remarked on the lack of factories and listed the Southern Railway as the major employer of labour in the town(79). By 1938 the section of the line from Wimbledon to Esher showed many of the characteristics of the urban fringe, with almost continuous housing developments (the most recent being on the London Clay) and the gaps being at the river valleys where the Hogsmill and Mole were used for servicing activities. Stations between Wimbledon and Woking all showed a steady rise in season ticket sales to London during the thirties, Woking itself increasing from 443 in 1935 to 497 in 1938.

Beyond Woking it seems that the railway made little impact on land use change during this period. Farming changes were the result of other economic forces and have been discussed earlier. Additionally the large holding of land by the military and by government departments ensured stability of land use. There is little evidence of any increase in long distance commuting. Season tickets to London from Basingstoke increased

from 43 in 1935 to 59 in 1938 and the issue was small compared with stations in the Nine Elms to Woking line of the transect.(79)

Thus the major changes in land use during this period were in the section between Wimbledon and Woking. Here developments in transport played a crucial part. Sometimes the railway company anticipated change at others it was the progenitor of it. But more often than not, transport was part of a complicated mix of commercial interests, which often lacked a centralised policy save that of the economic expedient, which was increasingly tempered by governmental participation.

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68. Based on interviews at various golf courses in the area. The annual handbook of affiliated golf clubs (to the P.G.A.) contains details of the foundation of clubs. The annual handbook of the Club Cricket Conference contains similar information for the foundation of cricket clubs. This information is of some use in considering the suburbanisation of an area.

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Number of trains arriving at Waterloo between (a) 0800 and 0900 and (b) 0700 and 0800 (with times of fastest train) September 1937.

Miles	Station	0800 - 0900	0700 - 0800
4	Clapham Junction	13 (8 minutes)	13 (11 minutes)
7¼	Wimbledon	17 (11 minutes)	16 (11 minutes)
9¾	Malden and Coombe	10 (14 minutes)	9 (15 minutes)
11	Berrylands	3 (20 minutes)	2 (26 minutes)
12	Surbiton	11 (16 minutes)	7 (16 minutes)
14½	Esher	4 (20 minutes)	4 (20 minutes)
16	Hersham	4 (23 minutes)	4 (23 minutes)
17¼	Walton	5 (22 minutes)	4 (26 minutes)
19¼	Weybridge	6 (26 minutes)	4 (30 minutes)
20½	West Weybridge	3 (32 minutes)	3 (33 minutes)
21¾	West Byfleet	4 (30 minutes)	3 (35 minutes)
24½	Woking	5 (32 minutes)	3 (40 minutes)
28	Brookwood	3 (39 minutes)	NIL
33½	Farnborough	2 (48 minutes)	NIL
36½	Fleet	2 (55 minutes)	NIL
40	Winchfield	2 (62 minutes)	NIL
42½	Hook	2 (68 minutes)	NIL
48	Basingstoke	2 (76 minutes)	NIL

Other than those shown, the fastest train of the day from Woking took 30 minutes and from Basingstoke 45 minutes, both arriving at Waterloo between 0900 and 1000.

Source: Southern Railway Standard Timetable. 27th September 1937. In British Transport Historic Records. (RAIL 979/25).

Cheap Day Return Tickets (unrestricted as to time of issue to Waterloo from stations from Clapham Junction to Basingstoke, September 1939.

Clapham Junction	8d.	West Weybridge	2/8d.
Wimbledon	1/3d.	West Byfleet	3/2d.
Malden and Coombe	1/3d.	Woking	3/5d.
Berrylands	1/5d.	Brookwood	3/11d.
Surbiton	1/7d.	Farnborough	5/3d.
Esher	1/8d.	Fleet	5/3d.
Hersham	2/1d.	Winchfield	5/6d.
Walton	2/4d.	Hook	5/9d.
Weybridge	2/8d.	Basingstoke	6/7d.

Source: A.B.C. Railway Guide. September 1939. In British Transport Historic Records. REF. RAIL 979/25.

Workmen's Return Fares Compared with other fares 1937

Distance	Workmen's Return	3rd Class Return	3rd Class quarterly Season (proportionate daily rate)
1 mile	2d.	3d.	3.08d.
2 miles	3d.	6d.	4.24d.
5 miles	6d.	1/3d.	6.92d.
10 miles	9.5d.	2/6d.	10.76d.
20 miles	1/2½d.	5/-	1/4.54d.

Source: London Passenger Transport Board Evidence to the Royal Commisson on the Geographical Distribution of Industrial Population. 15th February 1938.

Traffic Receipts for the Southern Railway from 1929 to 1938

10 months to	Passenger Traffic	Goods Traffic
October 1938	£14.405m	£3.961m
October 1937	14.439m	4.073m
October 1936	13.703m	4.097m
October 1935	13.321m	3.980m
October 1934	12.915m	4.165m
October 1932	12.379m	4.076m
October 1931	13.401m	4.542m
October 1930	14.197m	4.673m
October 1929	14.502m	4.829m

Source: Southern Railway Passenger and Freight Returns for 1938. British Transport Historic Records. RAIL 654/6.

TABLE SIX

AGRICULTURAL STATISTICS 1938 SOURCE: PUBLIC RECORD OFFICE SURREY MAF 68/3880 MAF 68/3868

Acres

	Wheat - Spring sown	Wheat - Winter sown	Barley	Oats	Beans	Peas	Potatoes	Turnips - field	Turnips - human consumption	Mangolds
Basingstoke		370	261.5	240.5		10	6.5	8	9	17.5
Winchfield		6.5	35	80		3	2	9		18
Newnham		15.5	6	10.25			.25	.75		5
Weybridge					.5	1	.5	2		3.5
Morden							.5			6
Walton		15	7		44.25		29	8.25	2.25	20
New Malden										
Wimbledon										
Wisley				22		.5	3	6.5		8
Woking										
Worplesdon	20.5	177.5	38.25	186	.5	3.75	64.75	19.75	1.5	58.25
Cobham	1	77	24	45	2	1	40.75	3		10.5
Kingston										

ACRES

	Sugar Beet	Cabbages	Sprouts	Cauliflower and Broccoli	Vetches	Lucerne	Onions	Orchards: fallow beneath	Orchards: small fruit beneath	Other crops	
Basingstoke		12.5	.25	2	9	5		10.5	1	38.25	
Winchfield	5	6								3.5	
Newnham		4.5			1.25			3.25			
Weybridge		12.5		.75		1		2.25		4	
Morden		10								4	
Walton		42	1½	10.5	1.25	5	11.25	.25	9.5	291.5	
New Malden									3	12.5	
Wimbledon											
Wisley		10.75					.25	33	51.3	5	
Woking											
Worplesdon		56.75	13.5	.5	2.5	2		24	1	18.75	
Cobham		54	10	3.5	5			22	15.5	75.5	
Kingston											

ACRES

	Fallow : bare	Clover for mowing this season	Clover for mowing next season	Permanent grass : mowing	Grass for grazing	Total acreage	Rough grazing	
Basingstoke	184.75	90.75	63.5	362.5	818	2512.75	21.75	
Winchfield	26	96		28	538.5	915	-	
Newnham	.25			89	158.75	300	26	
Weybridge	4			104	55.25	194.5	173	
Morden				84	116.5	221	100	
Walton	45	5	2	275.75	1538	1380	43.5	
New Malden					7.5	23	8	
Wimbledon				22	13	35	-	
Wisley		10		136.5	316.25	563	-	
Woking								
Worplesdon	50.5	159	22.5	498.5	1789	3243.75	-	
Cobham	19.5	45	36.5	371	1218.5	2080	-	
Kingston					35	35	-	

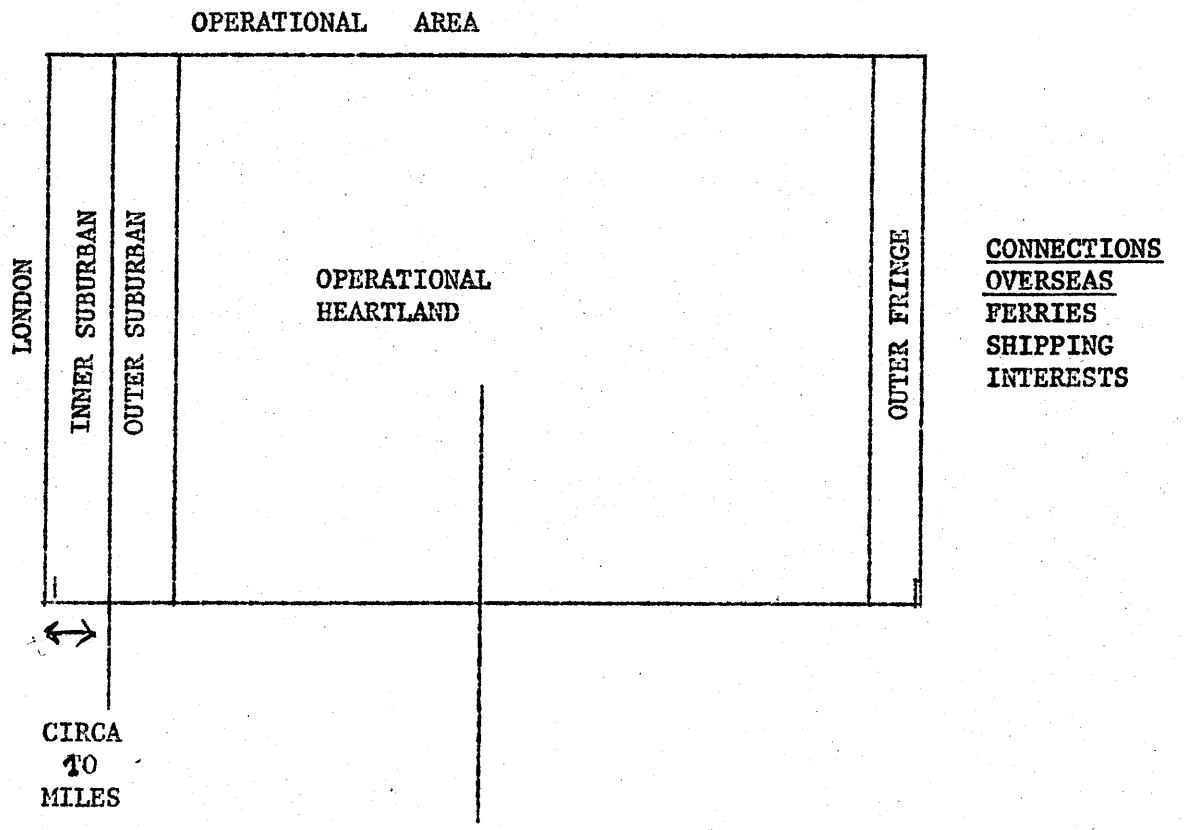
LIVESTOCK RETURNS 1938 SOURCE: AGRICULTURAL STATISTICS PUBLIC RECORD OFFICE

NUMBERS

	Horses	Cattle	Cows in milk	Sheep	Pigs	Chickens	Ducks	Geese	Turkeys	Agricultural workers
Basingstoke	66	478	123	25	339	19850	366	174	1	245
Newnham	9	89	59	-	13	3119	5	3	7	13
Winchfield	25	266	118	-	26	482	14	10	-	20
Weybridge	16	84	56	-	55	160	-	-	-	23
Morden	7	115	94	-	12	450	-	-	-	8
Walton	58	329	163	-	360	845	128	11	-	365
Kingston	1	15	15	-	36	-	-	-	-	4
New Malden	-	-	-	-	300	-	-	-	-	24
Wimbledon	-	2	2	-	-	-	-	-	-	4
Wisley	14	106	48	82	105	443	20	10	-	21
Woking	112	803	323	337	567	8425	398	27	22	468
Worplesdon	108	950	360	911	750	10056	175	101	66	109
Cobham	72	424	221	328	968	18422	110	40	-	152

Diagram 2

MODEL BASED ON RAILWAY RECORDS



DISCOVER PHYSICAL CONTENT (AGRICULTURE MINERALS)
URBAN CONTENT

SHAREHOLDERS EXPECTED GROWTH (BOTH IN EQUITY & ACHIEVEMENT) IN THIS CONTEXT OF FINANCIAL STABILITY AND 'BLUE CHIP' STATUS

TEMPERING INFLUENCES: SOCIAL & ECONOMIC CHANGE

DISCOVER RESPONSE TO WAR (E.G. FRANCO PRUSSIAN WAR : GREAT WAR)
TRAMWAY COMPETITION
MOTOR COMPETITION.

CHAPTER 7

AN OUTLINE EXAMINATION OF OTHER RAILWAY SYSTEMS AND THEIR INFLUENCE ON LAND USE CHANGE

The question arises as to what extent the land use changes exhibited in the line from Nine Elms to Basingstoke over a hundred year period are typical of those experienced along other sections of railway line which radiated from London. A general examination has been made of a number of railways companies. First the South Eastern Railway, which operated between London, Dover and Folkestone and which, together with the London Brighton and South Coast Railway amalgamated with the London and South Western to form the Southern Railway as a result of the 1921 Railways Act. Second the Great Eastern Railway, which operated between London and East Anglia and provided a component for the London and North Eastern Railway in 1921, and lastly the Great Western Railway which operated between London and the west of England as well as into Wales. The annual reports of these companies have been examined at various periods, first in 1870, the period when middle class suburban traffic had developed strongly on the London and South Western transect: then 1911, when intense competition from other means of transport was being experienced by that company in its inner suburban section: last in 1938, the period of the end of the study of the line. In particular, attempts have been made to distinguish the areas of special attention which were provided by companies at these various periods and which could be translated into spatial terms.

A common feature of all the railway company annual reports up to 1914 was that shareholders expected consistent expansion of activities both in terms of capital growth and in terms of profits. A significant feature was that of awkward questions put to directors by shareholders comparing the performance of various companies. Very often the directors themselves

made detailed comparisons with their competitors, especially when it was in their interests so to do. These comparisons were, in many cases, a vehicle to express the operational difficulties experienced by railway companies as well as to detail the efforts used by a particular company to overcome these difficulties.

A spatial model is thought to be of assistance in comparing the financial performance (as well as demonstrating the companies impact on land use change) of the various companies, because companies tended to concentrate their activities on various sections of their operational areas at different times in the company's development, selecting, generally, the section of their operational area which would yield the greatest profit in the economic short term. The operational areas of companies can be divided into a) an 'Inner Suburban Zone' which represented the area of continuous suburban development up to 1941, b) an 'Outer Suburban Zone' which was the area which enjoyed suburban development between 1918 and 1938, and c) the 'Operational Heartland' which was often substantial in size and was an area in which there was only marginal commuting into London. Lastly there was d) the 'Outer Fringe' which represented the connecting link between railway companies and their overseas interests. This spatial model does not include the 'non rail activities' of companies (which tended to increase by the end of the period of study) but these activities are mentioned whenever they are significant.

The 'Inner Suburban Zone' as has been demonstrated in the line, contained a large proportion of working people was texturally susceptible to cheap fare policies and was, as early as 1911 in the case of the London and South Western, an area where the company had met intense competition from other transport agencies. Additionally, this was an area where the technical limitations of the railways, as compared with other forms of suburban transport, were emphasised and where the technical performance of the railways, in terms of signalling acceleration and braking between

the stations, was crucial. On the line taken on the London and South Western, this section ended between Earlsfield and Wimbledon. The line 'Outer Suburban Zone' continued as far as Woking and the 'Operational Heartland' asserted itself on the section between Woking and Basingstoke.

A decisive factor in the emphasis placed on the development of the 'Operational Area' of a railway company was the economic and commercial potential of the 'Operational Heartland'. That of the London and South Western consisted of the Hampshire Basin, an area which, in the pre railway era, was an important arable and pastural producer, eager to extend commercial activities to the London market. Additionally the warm, south facing Tertiary slopes of the coastal plain had market gardening potential which could have been exploited by London if suitable transport links were to be established. As has been demonstrated, the Southampton and London Railway recognised this economic potential and emphasised it in their initial evidence to the Parliamentary Commission. The 'Outer Fringe' of the London and South Western, included the port of Southampton with its overseas (especially American and South African) connections, which remained politically stable and increased in economic importance throughout the period of study. Other ports in this 'Outer Fringe' included Weymouth, which carried out a lively trade with the Channel Islands, using ships owned by the railway company. For the company the 'Outer Fringe' included also the extreme south west, where new lines exploited the opportunities provided by preservation technology to develop the London market. With an 'Operational Heartland' which could react economically to the growth of London, and with 'Outer Fringe' activities which enjoyed sustained and uninterrupted economic growth, it would be expected that both the 'Operational Heartland' and the 'Outer Fringe' would receive substantial attention by the Company up to 1914, when Parliamentary activity dictated which areas should receive attention. This hypothesis is born out by an examination of Company reports as well as by an examination of contemporary timetables. There is no doubt that,

up to 1914, the London and South Western showed but moderate interests in the development of its 'Inner Suburban Zone' in comparison with other companies, but substantial concern at the operational losses made in this section in the period 1900 - 1914. Suburban emphasis by the Company was concentrated on the 'Outer Suburban Zone' where a combination of healthy soils (which had been initially unattractive to agriculture) a south west location (so that the smoke from this zone blew away over London) and a pre railway disposition for middle class residential location, made further middle class dormitory settlement an attractive proposition for the Company. It is demonstrable that the London and South Western Railway had developed its 'Operational Area' in a different way from the other component companies of the Southern Railway which came into being in 1921. And of these, the South Eastern Railway provided the most vivid contrast. The 'Operational Area' of the South Eastern Railway was small and thus the suburban zones constituted a larger proportion of the total 'Operational Area' of the company. A substantial part of this area was the high, comparatively rugged and infertile (and thus potentially agriculturally unproductive) Weald. Here railway construction was relatively expensive, resulting in steep gradients and frequent curves which cut down speed, retarded acceleration and increased commuting time in comparison with distance for distance. Within the 'Operational Area' of the Company, only the north Kent lowland and the vale of Kent had any significant economic potential in the period up to 1914. The 'Outer Fringe' included some of the numerous cross channel ports, but here political viscissitudes made economic growth (and at times even physical contact with the continent) uncertain. Wars, such as the Franco-Prussian war and the developing political rivalry between England and Germany were obvious inhibiting factors. Thus with the 'Operational Heartland' and the 'Outer Fringe' partially economically unpromising, it is reasonable to assume that the South Eastern Railway would have looked critically at

both its 'Inner and Outer Suburban Zones' for economic and physical growth. And this is confirmed by an examination of Company records. In January 1872, for instance, the Chairman noted the comparative economic working of the Company in its suburban zones. In what equated approximately to the 'Inner Suburban Zone' the Company's operating costs absorbed 39.7% of the takings, whilst for similar sections, the costs absorbed by the London and South Western amounted to 45%, the North Western 44%, the Great Eastern 46.75%, the Great Western 43% and the Midland Railway 44.25%. Thus the South Eastern worked at 4% less, in terms of operating costs, in these suburban locations than any other company having a terminus in London.(1)

There is no doubt that the South Eastern trimmed its operating costs in the suburban zones at an earlier date than other companies and was able to provide more trains and charge lower fares than its railway competitors in this area. The annual report for 1872 emphasised the economic desirability of building further suburban lines as well as the introduction of technological innovation ('Electrical Communication') in this zone(2). Significantly, the South Eastern developed links with other companies and in 1872 a link was established with the Metropolitan Company at Blackfriars. Whether these links were forged because of economic necessity, and whether they developed on terms advantageous or not to the Company is a matter of speculation. What is significant is that the South Eastern made a number of these links, whilst companies which were stronger in other sections of their 'Operational Area' made fewer. By the early eighteen seventies, the South Eastern was developing its 'Outer Fringe' with new lines between Hythe and Sandgate as well as purchasing vegetables in northern France and promoting these on the London market. Throughout its 'Operational Area' in the eighteen seventies, the Company was developing its third class traffic. In 1871, for instance, third class tickets (which were used increasingly by working

people) formed the bulk of those issued by the Company.(3)

Both the quest for further economies and the economic opportunism of the Company are illustrated by the 1911 reports. Then excursion traffic had benefitted both from the coronation of Edward VII and from station improvements at Crystal Palace where the exhibition attracted a stream of visitors(4). The Company had shifted its locomotive works from Battersea to Ashford and the land released was sold at a good profit. In the 'Outer Fringe' the Company was developing lines to the Kent coalfield. As early as 1909 the Company had made a definite statement concerning 'Inner Suburban' operations(5). Then, a passenger decline of nearly one million since 1908 had been reported in this zone, but it was demonstrated that, in comparison with other companies, the South Eastern was still the most profitable operator here. The developing tramways were blamed for this loss in traffic and the Chairman believed that tramways depreciated residential property whilst the railways appreciated it. He suggested that the city merchants, clerks and those employed in the city warehouses would move out because of this depreciation in property and that the Company should focus on the development of the 'Outer Suburban Zone'. This the South Eastern would develop by means of the electric railways of which it was a pioneer. At the same time the Chairman reported the development of non train activities, especially ships for the cross channel traffic, maintaining that this trade would develop because of the 'Entente Cordiale'.(6)

By 1938 the Southern Railway was emphasising its 'Outer Suburban Zone' as well as the profitability of its cross channel and Channel Island services. Realising that the possibilities of further economic advance and physical growth were limited, the Company has resorted to economies to keep financially viable. The introduction of new signalling, for instance, had closed two hundred signal boxes and saved £90,000 a year in operating costs. In the nineteen thirties the Company had

hovered often at around financial break even point. It had used some of the inherited expertise from the South Eastern in order to survive and the modernisation of the 'Inner Suburban' stations is a case in point, but it was in further electrification developing the 'Outer Suburban Zone' and reinforcing this with an interest in bus transport in some places, that it continued with the spatial emphasis shown by the South Eastern Railway twenty years earlier.(7)

The Great Eastern Railway had operating conditions similar, in many respects, to those of the South Eastern Railway. The bulk of the 'Operational Heartland' of the Company consisted of the agricultural and non industrial counties of East Anglia, which were climatically unsuited to milk production and were severely hit by the agricultural depression of the late nineteenth century. Only the Fens, with their substantial vegetable production for the London market, remained immune. In 1870 the annual report of the Company noted the agricultural distress in East Anglia and related the low price of corn to overseas competition as well as to the occurrence of diseases. The report remarked that agricultural traffice made up the bulk of the Company's freight traffic(8). Thereafter attempts were made to develop other parts of the 'Operational Area. Emphasis was placed on the 'Inner Suburban Zone' and in 1872, for instance, the Company was interested in a joint scheme with the Metropolitan Railway (the Bethnal Green extension): friendly relations between the two companies resulted in a variety of similar extensions: the Walthamstow extension, operating in the eighteen seventies proved profitable and the Whitechapel coal depot, which was owned by the Company and distributed coal to the east end of London, was very profitable indeed(9). By 1910 the Company was looking at both the 'Inner Suburban Area' and the 'Outer Eringe' to generate profits. In the 'Inner Suburban Area' the Company had reduced fares (to compete with the tramways) and had improved both the frequency and reliability of train services, resulting

in an increase in traffic. Additionally, the Company realised the potential of its 'Outer Suburban Area' and extended suburban facilities to Clacton, Frinton and Walton. All of the places were mentioned as having good 'two way services' for commuters[10]. By 1911 bogie trains were introduced for suburban services and these increased flexibility of movement into the London terminii[11]. In terms of the 'Outer Fringe' 'packet' services had been developed with both Germany and the Hook of Holland[12]. As a result of these developments, which were conspicuously outside the 'Operational Heartland' Company profits rose slightly in the critical and difficult years of the early twentieth century: significantly the ordinary dividend was held in the years before 1914. The suburban tactics of the Great Eastern Railway were developed by the London and North Eastern after the 1921 amalgamation, and the electrification of suburban lines was initiated: completion was in sight with the start of the work from Liverpool Street to Shenfield in 1938. Joint work with other inner London companies persisted, particularly through a fruitful operating arrangement with the London Passenger Transport Board[13]. After amalgamation the new 'Operational Heartland' extended to Scotland and the London and North Eastern developed this area with an emphasis on speed, vividly illustrated by the 'Silver Jubilee' and the 'Coronation' which could both exceed 100 m.p.h. Similar fast services were developed for the West Riding. The 'Outer Fringe' activities which had been disrupted by war, revived partially, but Company profits were enhanced by diversification into 'Non Rail' activities. By 1938 the Company had invested £2.30m in bus companies which made an impact on land use change, especially, the 'Outer Suburban Area'. An unspecified sum was invested in Carter Paterson and Pickfords[14]. By 1935, at a time much later than those started by the South Eastern, the Company initiated operating economies, motor transport replaced horses saving 'a great deal of money'.[15]

If the South Eastern Railway and the Great Eastern had operational

similarities in terms of their spatial operational emphasis, the Great Western differed from both of them markedly. The Great Western's 'Operational Heartland' consisted not only of agricultural land, which weathered the agricultural depression in the late nineteenth century better than East Anglia, since the London milk trade developed there under more suitable climatic conditions, but also of the areas of developing coal mining in South Wales. By 1900 many of the Welsh mineral railways were under Great Western control. The Company's 'Outer Fringe' consisted of both Irish and North American connections which were developed from the outset by Brunel and which flourished, expanded and contributed to the physical and economic growth of the Company throughout the period of study. The Company had done no more than keep to the intensions announced by the proprietors in 1835 - 'Developing the agricultural, commercial and manufacturing interests within the 'Operational Area'. The proprietors had stressed the importance of long distance traffic, mentioning especially, Maidenhead, Bristol and Bath(16). Thus the Great Western was able to grow, both physically and economically, without excessive development of its suburban zones. Additionally, the conversion to narrow gauge took up energy and resources (which might have been utilized elsewhere) but also created new commercial opportunities in the late eighteen sixties(17). Company reports then emphasised the commercial interest in moving farming products to London: the Company had an interest in the new meat and poultry market at Smithfield(18). Especially at this period, the Company was developing new lines in the 'Operational Heartland' and developing trading links with Ireland. Some efforts were made to come to operating agreements with inner city companies. The Great Western was in a position to dictate terms and these embryonic agreements did not come to fruition. Of these, the most ambitious was a proposed link to Farringdon Street, by means of the Hammersmith and City Junction Railway.(19)

In the early years of the twentieth century the Great Western was

still developing the distant ends of its 'Operational Heartland' as well as the 'Outer Fringe'. In 1909 for instance, the Channel Island traffic was emerging and in 1910 improvements were made to Fishguard harbour, both reflecting increases in trade[20]. In 1911 and 1912 the emphasis was on track doubling to these distant places. Some interest in the further extension of suburban operations is provided by a financial interest acquired in the London Electric Railway in 1911, which operated between Baker Street and Waterloo[21]. Jahn (1970) has noted the effects of interest groups in attempting to gain improvements in the Company's suburban services[22]. Freight, however, still provided the Company with growth and the freight depot at Paddington Green was suffering from severe congestion. At the same time as the South Eastern was selling some of its high value inner city land, the Great Western was acquiring more, and a second freight depot was built at South Lambeth in 1909, access being obtained by means of the West London Extension Railway which was owned jointly with the London and South Western.[23]

By the nineteen thirties the depression had hit the 'Operational Heartland' of the Great Western Railway, compounded by a miners' strike in South Wales[24]. The Company had, like the London and North Eastern, been shrewdly diversifying its activities. By 1935 the Company had large investments in bus companies, including those of the city of Oxford, the Devon General and the Western National: the total investment in these activities amounted to £4.55m[25]. These investments, in combination with the introduction of the economical rail motor car for local country services, kept up the profit level of the Company, which belatedly turned its attention ot the suburban zones. In 1938 for instance, the track from Lord Lane to North Acton was quddrupled and operational agreements were concluded with the London Passenger Transport Board.[26]

There seems little doubt, therefore, that differing company policy, resulting from differential spatial opportunity for the achievement of

growth in terms of both size and profit, is one of the uneven suburban development, both in size and texture, of London during the period 1838 to 1938. These suburban zones, more than any others, responded greatly to the differential emphasis placed upon them by the various companies operating from London. And this poses the questions of how far was London unique in this respect?

Weyl (1901), by a review of the international operating policies of railway companies, devised a model which might be applied to any national company. First he believed that this model might be tempered by the zone tariff, which he claimed, was a desirable instrument for providing low fares(27). The zone tariff had been initiated in Great Britain when, in 1840 the penny post was introduced. Weyl had maintained that the early losses incurred by the penny post made Parliament disinclined to allow it to be used by the early railway companies in Great Britain, although there is little evidence that companies were keen to introduce it. The absence of a zone tariff in Great Britain is reflected in fare stage limits which had spatial repercussions, as have been demonstrated in the line from Nine Elms to Basingstoke, and is reflected in differential property developments at various stages along it.(28)

The second, and again almost universal component, of Weyl's model, was that railway companies had held fares at a rate higher than operational costs would bear and the inference was that, because of this, the spread of cities in the nineteenth century had been artificially retarded(29). Thirdly, he had demonstrated that passenger traffic on railways was greater in countries of smaller area and denser population than in countries of larger area and lower population densities. A conditioning influence here, he maintained, was the 'state of civilization and progress' attained by nations(30). If this term is translated into 'the standard of living', then an assessment of the income of the occupants of the operational area of a railway company is essential. A crude indicator, of this 'state of

civilization' Weyl demonstrated, was a correlation between letters and passengers carried by a company.(31)

War, Weyl demonstrated, has an effect on influencing the volume of passenger traffic: the payments for the movement of troops did not compensate for the decreased movement of ordinary passengers. And almost without exception, wars had resulted in higher railway fares, which where they occurred, delayed urban expansion. To offset this disadvantage railway companies on the continent had attempted to develop passenger traffic as well as to try to stimulate urban expansion, by the introduction of four classes of passenger travel(32). As intra urban competition had developed for the railways (and this was evident universally in the period immediately before 1914) companies had developed an economic theory of suburban travel. Fares for the poorer people, it was stated, should be so low that they, in combination with suburban rent, should not exceed the rent charged in the inner city. Weyl had discovered that this theory was extensively and universally tested by means of season tickets and other similar devices(33). And finally Weyl maintained that the absolute railway mileage of a country was an important factor in encouraging land use change. Until 1970, the passenger mileage of Great Britain and Ireland was the largest in Europe. After 1970 Germany overtook the United Kingdom as did, in the eighteen eighties, France and, in 1893 Russia, and in 1898 Austro Hungary. By 1900 an index of railway provision, the Eisenbahnausstattungsziffer, was in use in Germany. This utilised the number of miles of railway in 100 square miles and multiplied this figure by the number of miles of railway per given population (say 10,000) in a state. The result was a close grouping of the United Kingdom (9.7), Germany (9.4) and France (.3). In Europe Belgium was outstanding at 13.7 and the U.S.A. as a whole recorded 12.4. In these areas then, according to the German originators of the Eisenbahnausstattungsziffer, land use change should have been above average and it is interesting to

note that the eastern seaboard of the United States recorded figures which accorded with those of Great Britain, France and Germany.(34)

Since the eastern seaboard of the United States, Great Britain, France and Germany recorded approximately identical figures by means of the Eisenbahnausstattungsziffer, it seems valid to make comparisons between these locations at the turn of the nineteenth century. Then there was an especially sound financial base in Massachusetts. In the eighteen forties, those with accumulated capital had looked favourably at railways as investment opportunities, believing that railway connections with the Welland and Erie canals would make Boston a major competitor for the developing western United States trade(35). Additionally, Bostonians had made then significant investments in distant western cities: these investments reinforced the railway investments they had made in these places(36). As a result of the opportunities available in this large operational area (which by 1900 contributed up to 70% of railway company earnings) steam railway companies had yielded willingly much of their short haul business to smaller companies who often initiated electric lines(37). Additionally inner city land, previously held by the larger companies was sold often to raise capital for activities elsewhere. At the intra urban level Johnson and Huebner (1911) remarked on the fact that these electric lines were often complementary to the steam lines, especially as one moved away from the eastern seaboard of the United States(38). In these places especially the older established steam lines developed their east west traffic without recourse to the building of minor lateral spurs, Johnson and Huebner had noted some of the advantages of the American electric railway which showed up as points of distinction between the British and American systems. First American railways invariably entered the heart of the city so that the travelling public was near both residence and offices. Second, they concentrated on frequency, comfort and convenience rather than speed alone and third that the introduction of

'Commutation Tickets' (which could be purchased up to a year ahead) proved to be a simple adaptation of the zone tariff[39]. These general points are precisely, as well as locally, illustrated by Warner (1965) in his study of Boston. In Boston electric railways were introduced in 1889 and these lines supplemented the services of steam railways[40]. They were the heirs to the successful horse drawn street railways, which had run between three and five miles from the city centre and had attracted substantial building activity in the expanding city[41]. A correlation had been noted between the success of street railways and the frequency of the services they offered. By 1900 a good network of linear electric services radiated from the centre of Boston and, at at a distance of about six miles, links between the linear routes ('Crosstown Services') were developing. In this crosstown situation, Warner observed that, for the first time, building activity was beginning to encourage the expansion of the services as well as the service encourage building. Warner equated occupational divisions with travelling opportunity and there is no doubt that, because American working hours were shorter in 1900 than those in Greater London, Bostonians had a greater potential spatial area in which to reside. The most immobile Bostonians were the ambitious lower middle class who, as family units, required multiple employment which demanded both linear and crosstown services simultaneously. (In the London and South Western transect there outward residential limit would have been Wimbledon and the point at which both linear and crosstown services were most strongly developed was Clapham Junction). The central middle classes, according to Warner, had but one breadwinner, who would have been likely to use the linear railway services especially, and could live beyond the linear/crosstown junction if he so desired. And lastly in Boston, the wealthy, who had in 1900 the greatest individual control over their hours of work, could live in the personally most desirable site, wherever this was to be found.[42]

In Germany, political economic and social conditions differed substantially from those in both the United Kingdom and the U.S.A. at the outset of railway building. Milward and Saul (1973) point out that railway building was not only part of the economic development of Germany but also influential in the unification and simplification of the European heartland(43). Early railway building in Germany had focussed on economic development, for the Germans were aware that both the Dutch tolls (levied on the Rhine), as well as their own poor roads were substantial inhibitions to trade(44). Clapham (1961) had demonstrated, for instance, that the east German towns were both small and half rural and compared unfavourably with other European towns at the beginning of the railway age(45). In Germany, the initiative for railway building was taken by Prussia who, by 1842 had built over 1,000 miles of lines. Smaller German states, fearing loss of trade because of this initiative strove to keep pace with Prussian railway building(46). But because of Prussian economic predominance, Berlin became the centre of the German railways and became a powerful factor in the quest for German unification(47). Railways radiating from Berlin attracted the attention of interest groups and the Junkers, for instance, by 1850 had petitioned the Prussian government to build a railway to East Prussia, fearful that otherwise they would lose markets for their corn and that the impact of Prussian culture on these Polish lands would diminish. Additionally, the Junkers saw the railway as a means of presevering their political power in the capital(48). It was, therefore, in the context of both national, as well as economic criteria, that railway building took place in Berlin. It was only after 1871 that the role of railways in intra urban population dispersal and hence in contributing to land use change, was recognised. After 1871 continuous population growth (0.83m in 1871: 3m in 1900) in combination with pressure by commercial agencies to acquire land in the city centre proved to be incentive for the outward growth of the city(49). The first

area of development was between the old city centre and the Ringbahn (the circular railway constructed between 1861 and 1877)[50]. Between these two locations, high houses (six to eight storeys) utilizing narrow but deep plots, grew up. Significantly, these plots embraced all social classes. Expensive, low density housing, existed within this territorial arrangement along the important streets, but behind this facade lived the lower classes in cheaper and often, overcrowded, conditions[51]. Short distance penetration to the city centre was provided by tramcars, which, by 1900 were under the control of one company (Die Grosse Berliner Strassenbahn Aktien Gesellschaft) which charged low flat rate fares. These fares, in turn, encouraged commuters to live out and developments were taking place beyond the Ringbahn, especially tentacular developments which had extended well beyond the Ringbahn in some instances[52]. By 1910, superior, low density middle class suburban development, which often exploited lakes and woods, had taken place along some of the main, long distance railway lines. Often these lineswere partially enlarged by the introduction of the Stadbahn (1874 - 82) which had originated in the western city and was connected with the earlier Ringbahn[53]. Both the Stadbahn and the Ringbahn charged flat fares but the Stadbahn had abolished both first and fourth class travel. At an early stage double tracking was introduced on the Stadbahn so that services did not interfere with those provided by the main railway lines[54]. There is no doubt that both railways and trams assisted in population dispersal in Berlin in the period up to 1914, but the segregation of social classes was not pronounced in the inner suburbs generally. The pressure of offices for a central location was partially relieved by the ingenious Rohrpost, the system of sending letters by pneumatic tubes (taking about half an hour to deliver) in a substantial city network.[55]

Dickenson (1951) has commented on the physical site of Berlin and of its importance as an aid to population dispersal. There is no

doubt that the higher land surrounding the city (often with views over lakes and forests) would have been attractive to those who could afford to live in such locations[56]. Population movement was assisted too by the early emergence of a city planning authority which initiated both residential and industrial dispersal. This authority, by 1900 had taken control of the transport services[57]. The activities of this authority released central area land for building and, in particular the authority demolished the old customs wall (the Zollmaner) replacing it by roads containing both residential and commercial developments[58]. The authority assisted in the development of allotment gardens, which were often quite substantial plots, at some distance from the city centre. These allotments were irrigated by sewage water (the Rieselfelder) and proved to be highly productive. Additionally they stimulated urban interest in the countryside[59]. Lastly, the planning authority in combination with the city fathers, was keen that factory building should take place beyond the Ringbahn but along existing radial routes. Here developments were subtantial in the last twenty years of the nineteenth century.[60]

In the case of Berlin, therefore, a number of factors combined to initiate land use change on the city boundaries. Of these, the political impact of interest groups, the early involvement of a planning authority as well as a distinctive transport policy are an immediate contrast to factors operating in south west London during the same period.

In contrast to Berlin, Crone (1941) described the growth of Paris as 'haphazard and unco-ordinated[61]. Dickenson (1951) has remarked on the lack of co-ordination and indeed communication, between the various nineteenth century transport agencies[62]. Before the coming of the railways the river system had been used extensively to bring foodstuffs into the city. Additionally, the national road building programme, which commenced in 1814 had proved to be a useful supplementary means of

moving foodstuffs from the countryside to the city[63]. French canal owners had viewed the prospect of the coming of the railways with alarm and the French parliament believed that railways had the potential to subdue parliamentary power[64]. Against this the success of the British railways had proved that they were a useful tool in economic progress.[65]. By 1852 a national railway programme had been drawn up, routes were prescribed by the government who negotiated also for the land. Local authorities were directed to find two thirds of the railway building costs concentrating their efforts especially on bridges and tunnels. The building programme was subdued first by the financial crisis of the early eighteen forties and later by the revolution of 1848[66]. By 1859 some economic stability had returned and six large railway companies operated over the whole of France. A proportion of the profits of successful companies had to be reinvested in branch lines, the routes of which, in many cases were prescribed by parliament and included Parisian suburban routes. Parliamentary legislation encouraged the concept of individual (and often isolated) identity for the railways and this had been a feature of earlier roads and canals[67]. This characteristic was assisted further by physical geography, especially the discontinuous circle of forests[68]. The gaps between these provided a base for tentacular growth of both buildings and communications. The constraint of the forests may have assisted in compelling the erection of high buildings in the city centre where building land was made scarce by the installation of larger fortifications in 1840. These remained until the late eighteen seventies.

Thompson (1970) has commented on the tentacular growth of Paris after 1870. By 1900 an inner circle of electric railways (la petite ceinture) had facilitated movement between the terminii which had been placed on the edge of the city in the eighteen forties. Also by 1900, an outer circle of railways, well beyond the existing suburban limits

has grown up. Between these two circular railways goods and marshalling yards had emerged, the latter near the outer limits of the city and inconveniently placed. After 1914 some of the land previously occupied by marshalling yards was released as freight traffic had been lost to the canals. This land and other sites which were situated beside the railway lines radiating from the city, came under the influence of speculative builders. The rapid development of these unplanned 'lotissements' which resulted in a sea of small houses, sited on diminutive plots was an especial feature of the interway growth of Paris. The resulting tentacular development was especially noticeable in the south of the city(70). This growth was assisted as well by the introduction of low tiered fares which originated in 1910.(71)

CONCLUSION

The intention of this thesis has been to investigate whether there is any merit in applying a macro scale interdisciplinary approach to the topic of land use change over time, using a line along a section of railway.

The Von Thünen model of land use, which is applicable to areas surrounding cities, involves a consideration of both economic and technological variables, has, since the second world war, been the basis of the geographers' explanation of land use change. The deficiences of Von Thünen as a dynamic model have been revealed both by Grötewald (1959)[72] and by Chisholm (1962)[73]. It is clear that geographers strongly economic theory, physical geography as well as technological evolution as significant factors in land use change. In the case of land use change in the Greater London area since 1838, the deficiencies of an entirely geographical approach, as an attempt to explain this change, have emerged strongly throughout this thesis. There is no doubt that recourse to researchers in other disciplines have revealed such relevant points as social change, legal and financial restraint as well as the contribution of informal political groups, as potent contributory factors. Throughout this thesis, therefore, an emerging suggestion is whether the single disciplinary base for the consideration of aspects of land use change should be broadened. Some researchers have ventured this way already: Dyos (1952)[74] has remarked that the existing social character of suburbs may well have influenced the texture of these places when the railway came. As a pre - railway indicator he refers to Boyle (1776)[75] who listed 'country seats' and used these as an index of socially superior settlements. Thus, for example, Richmond, which had thirty six "country seats' in the pre railway era would, according to Dyos, have been likely to remain a superior suburb to say Wimbledon, which, at the same time enjoyed only thirteen, and to Kingston with only five. Dyos has demonstrated that the

pre - railway social superiority was not always strong enough to resist social change very near London. Here a complex variety of topics requiring interdisciplinary investigation combined. At Clapham, near the northern limit of the study line, eleven pre - railway 'country seats' existed, yet Clapham deteriorated rapidly after the railway arrived. Dyos identifies a also, substantial social changes occurring with the coming of the tram. The tram, he maintained, generated noise, diminished social amenity and raised property densities, encouraging, therefore, the migration of the mobile middle classes to more distant suburbs(76). This diagnosis can be researched only by an interdisciplinary approach. Both Dyos and Rolfe (1968) remark on the limited settlement between the main roads in the immediate pre - railway ere in London. By 1870 Dyos asserts that settlement along the main roads out of London had gone furthest in the south west and that, at last, development was beginning to emerge away from them and he believes that this process had been assisted by the coming of the railway as well as reflecting various levels of social mobility(77). Rolfe reports a partly similar pattern in south east London where, for instance, the area between Norwood and Bromley developed early as a result of railway activity(78). The combination of social preference and technological inadequacy is revealed in the period 1871 to 1911 when Dyos noted that suburban development in south west London had skipped over the London Clay. Continuous settlement then ended at Wimbledon and reasserted itself at Epsom, Sutton and Croydon(79). Rolfe emphasises the avoidance of marshland at Bermondsey and Jahn (1970) comments on the difficulties of providing drainage in the London Clay during the same period.

It is likely, therefore, that it is in an amalgam of the methodology of Dyos, Rolfe and Jahn, applied at the macro level and allied with the Geographers' contribution, that the majority of answers to the questions of land use change would be established. Additionally, in this thesis, the general examination of railway development of the overseas examples

of Berlin, Boston and Paris, reveals points additional to those discovered in the exploration of the line from Nine Elms to Basingstoke. The size of the country, the state of economic development, the degree to which railway building and operation could be manipulated by both politicians and interest groups all emerge strongly as points initiating as well as tempering land use change. In 1838 along the line investigated in this thesis, transport deficiency is highlighted, as is the free market in agriculture with concomitant economic instability. Personal immobility imposed on certain sections of the population, vividly illustrated by the 'Poor Laws' compounded a picture of part structural unemployment and part unfilled vacancies which together contributed to the unequal nature of the land use pattern at the local level. By 1871 the impact of the prosperous middle classes on land use change is evident along the studied line and the preference of this social class for residence in south west London is revealed in this section of the thesis, but it remains to be researched as to whether this preference was spontaneous or partially directed by a range of other factors. The importance of steam technology in terms of transport development and its application to agriculture is significant in promoting land use change at this time as well. By 1911 the transport deficiencies of 1838 have been reversed and the impact of severe transport competition, particularly in the northern section of the line of study, is reflected in changing land use texture. Additionally, the impact of substantial social change, both in family structure, the nature and length of work as well as the influence of a large, partly prosperous but agriculturally contributing empire all explain, in part, land use changes at this time. Finally, in 1938, a period of incipient planning is highlighted, adding yet another academic disciplinary dimension, whilst both farming and house building responded in different ways (farming weakly and house building strongly) to the last years of a comparatively economically free market.

At the micro level, the study of land use change along the line from Nine Elms to Basingstoke reveals features, often essentially local in character, which appear to contribute to the textural distinction of land utilisation. Nevertheless the merit of the macro level and inter-disciplinary approach, as utilised in this thesis, rests with the emergence of easily discernable and dynamic land use patterns which could form a basis for further interdisciplinary or single disciplinary investigation. It is the belief that the macro level interdisciplinary approach complements the work of the micro level single disciplinary researcher who, in the case of this studied line, might investigate estate and family papers, business and industrial records and solicitors' archives as well as the topic of the control of land utilisation at various stages in time. Further macro level interdisciplinary work both in Britain and abroad might disentangle the complexity of land use change which is, at present, highlighted by detailed local study.

Finally, a consideration of land use change along a line from Nine Elms to Basingstoke demonstrates that the building of the railway on land use change was incontrovertible and is vividly illustrated by the fact that agricultural land existed a short distance away from the built up line to the south east and within the Greater London Council boundaries, and could be used for the building of the Esher by pass in the early nineteen seventies.

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2. Annual Report of the South Eastern Railway. 25th July 1872.
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4. Annual Report of the South Eastern Railway. 28th August 1911.
5. Half yearly Report of the South Eastern Railway. 29th January 1909.
6. Ibid. (This is a particularly useful report and represents a definitive statement as to the future operational strategy of the Company).
7. Annual Report of the Southern Railway. February 1938.
8. Annual Report of the Great Eastern Railway. 27th July 1870. This develops themes discussed in the half yearly report of 16th February 1870.
9. Half yearly Report of the Great Eastern Railway. February 1872.
10. Half yearly Report of the Great Eastern Railway. January 1911.
11. Annual Report of the Great Eastern Railway. July 1910.
12. Half Yearly Report of the Great Eastern Railway. January 1910.
13. Annual Report of the London and North Eastern Railway. 1939.
14. Review of 1936: London and North Eastern Railway.
15. Review of 1935: London and North Eastern Railway.
16. First Meeting of the Proprietors of the Great Western Railway 1835.
17. This theme is developed in a number of half yearly and Annual Reports of the Great Western Railway from 1864 to 1869.
18. Half Yearly Report of the Great Western Railway 1869.
19. Ibid.
20. Half Yearly Report of the Great Western Railway. 18th February 1909 and Annual Report of the Company. 11th August 1910.
21. Annual Report of the Great Western Railway. 30th June 1911.
22. M.A. Jahn. ' Railways and Suburban Development in Outer West London: 1850 - 1900. ' Unpublished M. Phil thesis. University of London. 1971. p. 2 and p. 75. The reluctance of the Company to build suburban stations is noted, and early exception was the station and goods yards built at Drayton Green for £6,500 in 1869 and revealed in the 1869 Annual Report of the Company.
23. Annual Report of the Great Western Railway. 12th August 1909.
24. Annual Report of the Great Western Railway. 1932.
25. Annual Report of the Great Western Railway. 1935.
26. Annual Report of the Great Western Railway. 1938.
27. W.E. Weyl. 'The Passenger Traffic of Railways'. Philadelphia. 1901. p. 9.
28. Ebid p. 9.
29. Ibid P. 10. (It was precisely this attitude which led to Parliamentary introduction of the Cheap Trains Act in Great Britain).
30. Ibid p. 12.

31. Ibid P. 13. (various national examples are given in the text).

32. Ibid p. 14.

33. Ibid p. 61. p. 65.discusses the potential loss of leisure for long journeys. Weyl comments on the American disinclination so to do.

34. Ibid p. 72 ff.

35. R. Hofstadter et al 'The American Republic' Vol. 1' Prentice Hall: New Jersey 1959. p. 548.

36. Ibid. p. 549.

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39. Ibid p. 40.

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41. Ibid. passim.

42. Ibid p. 52 and p. 53. and ff. The relationship between social class, transport provision and residential location is analysed and developed here. There seems little doubt that many of Warner's findings are applicable to other cities.

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45. Ibid. p. 155.

46. Ibid. p. 152.

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50. Ibid. p. 12.

51. Ibid. p. 53.

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53. Ibid. p. 54.

54. Ibid. p. 12.

55. Ibid. p. 26.

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57. Ibid. p. 240. Dickenson remarks that this topic is discussed further in M. Pfannschmidt. 'Die Industriesiedlung in Berlin and in der Mark Brandenburg.' Stuttgart and Berlin. 1937.

58. Ibid. p. 238.

59. Ibid. p. 245.

60. Ibid. p. 240.

Changes in land utilisation along the line of the London and South Western Railway from Nine Elms to Basingstoke 1838 - 1938.

The study of land use change has long been the province of separate disciplines notably geography and economic history. The intention of this thesis is to demonstrate that land use change is essentially an inter-disciplinary area of research and that, unhindered by the strict methodological parameters of individual disciplines considered separately, an understanding of land use change along the line of the London and South Western Railway from Nine Elms to Basingstoke might be attempted.

Four periods in time have been chosen for this study. In each, attempts have been made to recreate and comment upon the contemporary land use pattern. The first period is 1838 immediately before the railway was opened. The second, 1871, just before the passing of the Cheap Fares Act (and the subsequent extension of suburban London). The third period is 1911, a time when railways were beginning to meet with competition from other forms of transport particularly in the inner London suburbs, where complicated cross town transport provision was beginning to emerge. The last period is 1938, the climax of both the interwar suburban explosion and agricultural depression.

Finally, brief comparisons are made, in terms of land use change, with other London railway companies which operated during the period of study and similar consideration is given to the impact of railways on land use change in Berlin, Boston (Massachusetts) and Paris in the expectation that other relevant information would be revealed.

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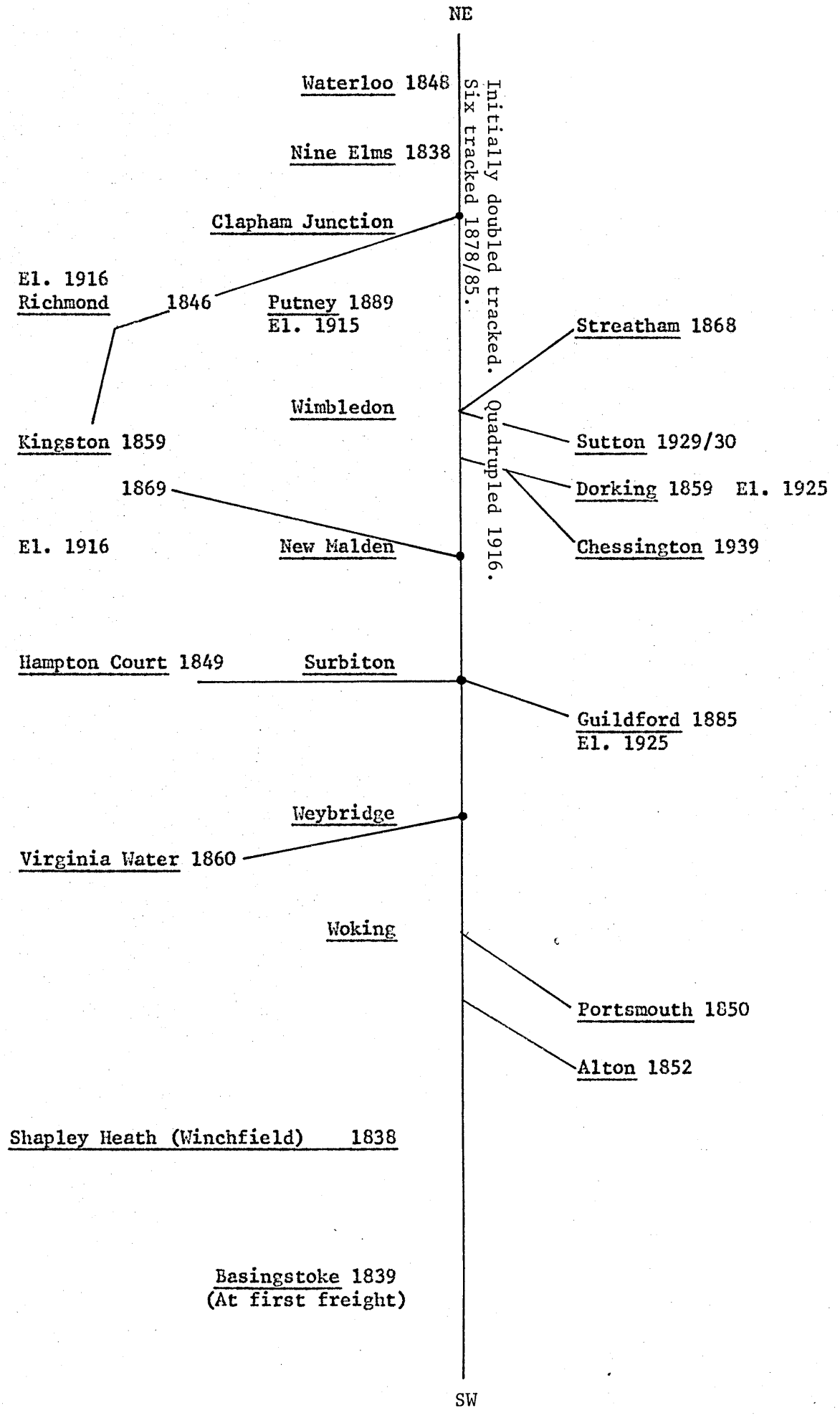
Appendix (1) Dates of tracking changes:

Electrification and opening of link lines.



Appendix (2) Date of the opening of railway stations.

Source: C.F.D. Marshall History of the Southern Railway Ian Allan. London 1960

Nine Elms	21st May 1838	Closed 11th July 1878
Clapham Junction	2nd March 1863	
Earlsfield	1st April 1884	
Wimbledon	21st May 1838	
Raynes Park	1st October 1871	
New Malden	1846/7	
Berrylands	16th October 1933	
Surbiton	21st May 1838	
Esher	21st May 1838	
Walton	21st May 1838	
Weybridge	21st May 1838	
West Weybridge	10th July 1927	
West Byfleet	December 1877	
Woking	21st May 1838	
Fleet	1847	
Farnborough	24th September 1838	
Basingstoke	10th June 1839	

Appendix (3)

Maps contained in separate portfolio.

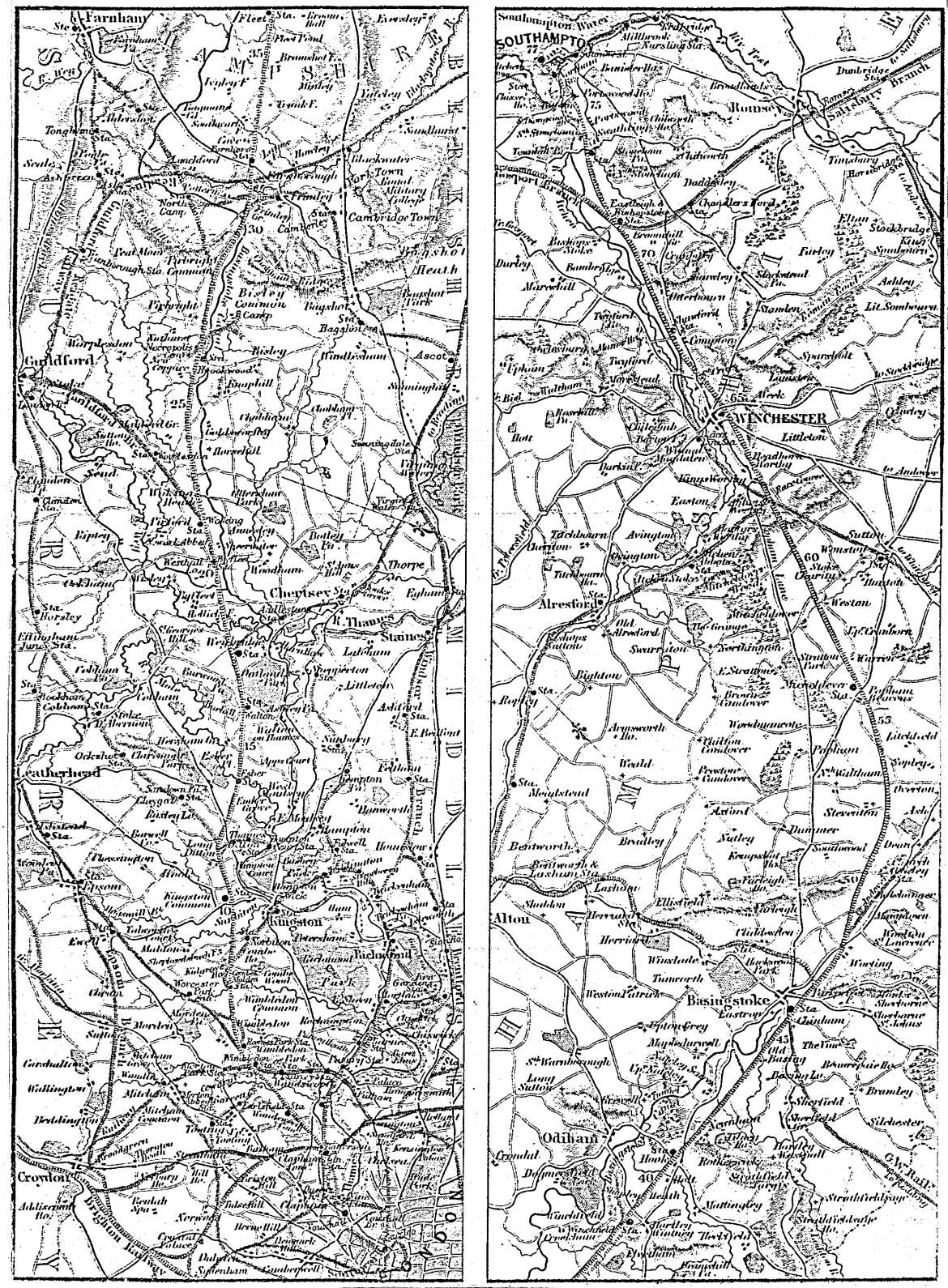
Specimens of maps relevant to the text of the thesis are included here and comprise:-

Carey One inches to one mile 1830. Nine Elms to Wandsworth.

Ordnance Survey Six inch maps.

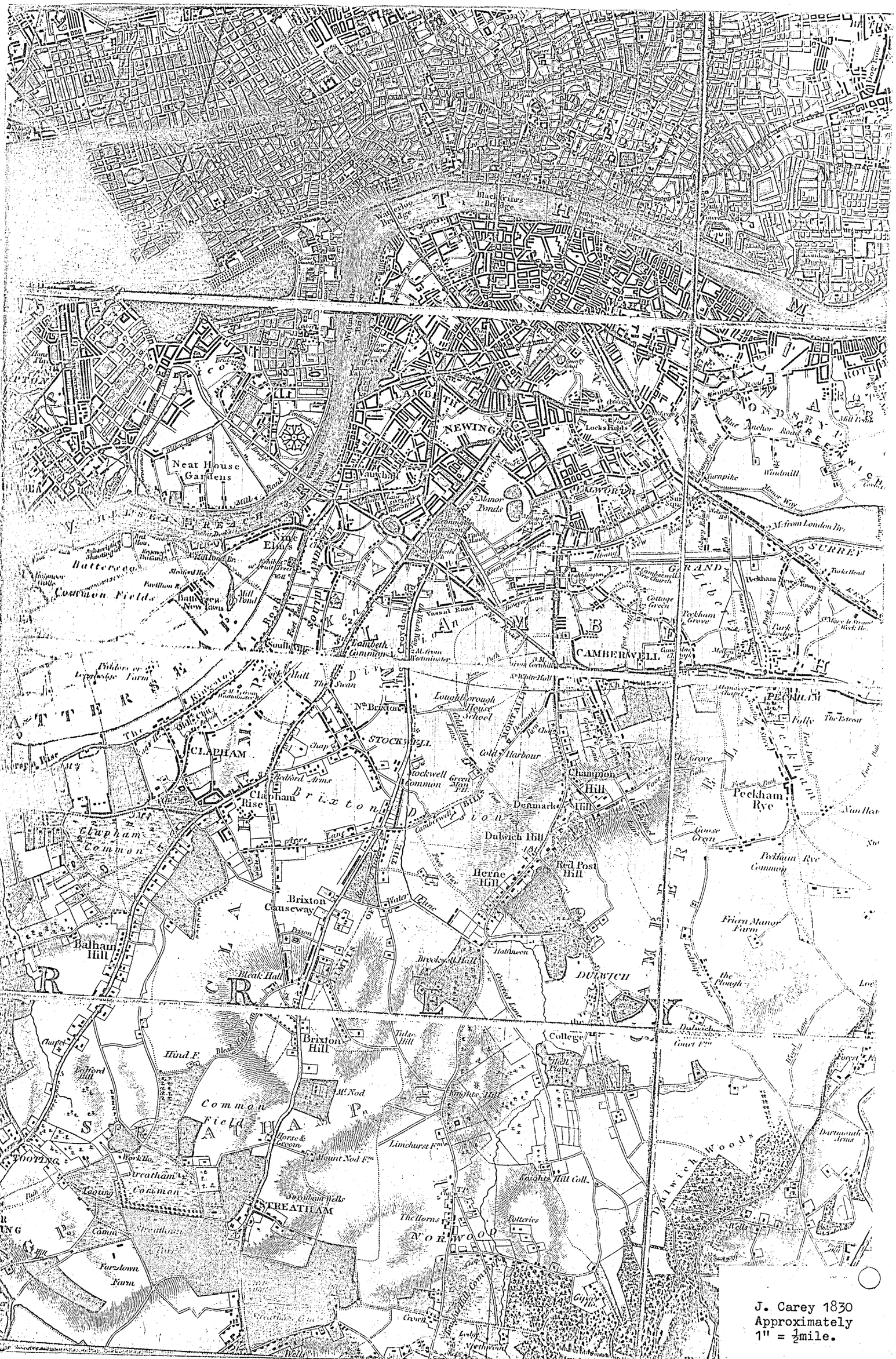
Nine Elms	1863	1894	1938	
Clapham Junction	1865		1938	
Earlsfield		1894	1938	
Wimbledon	1865		1938	
New Malden	1871	1898	1914	1938
Surbiton	1871		1919	
Walton		1897	1919	
Byfleet		1897	1920	
Woking	1872	1897	1920	
Hook	1875	1897		
Basingstoke	1877	1897	1938	

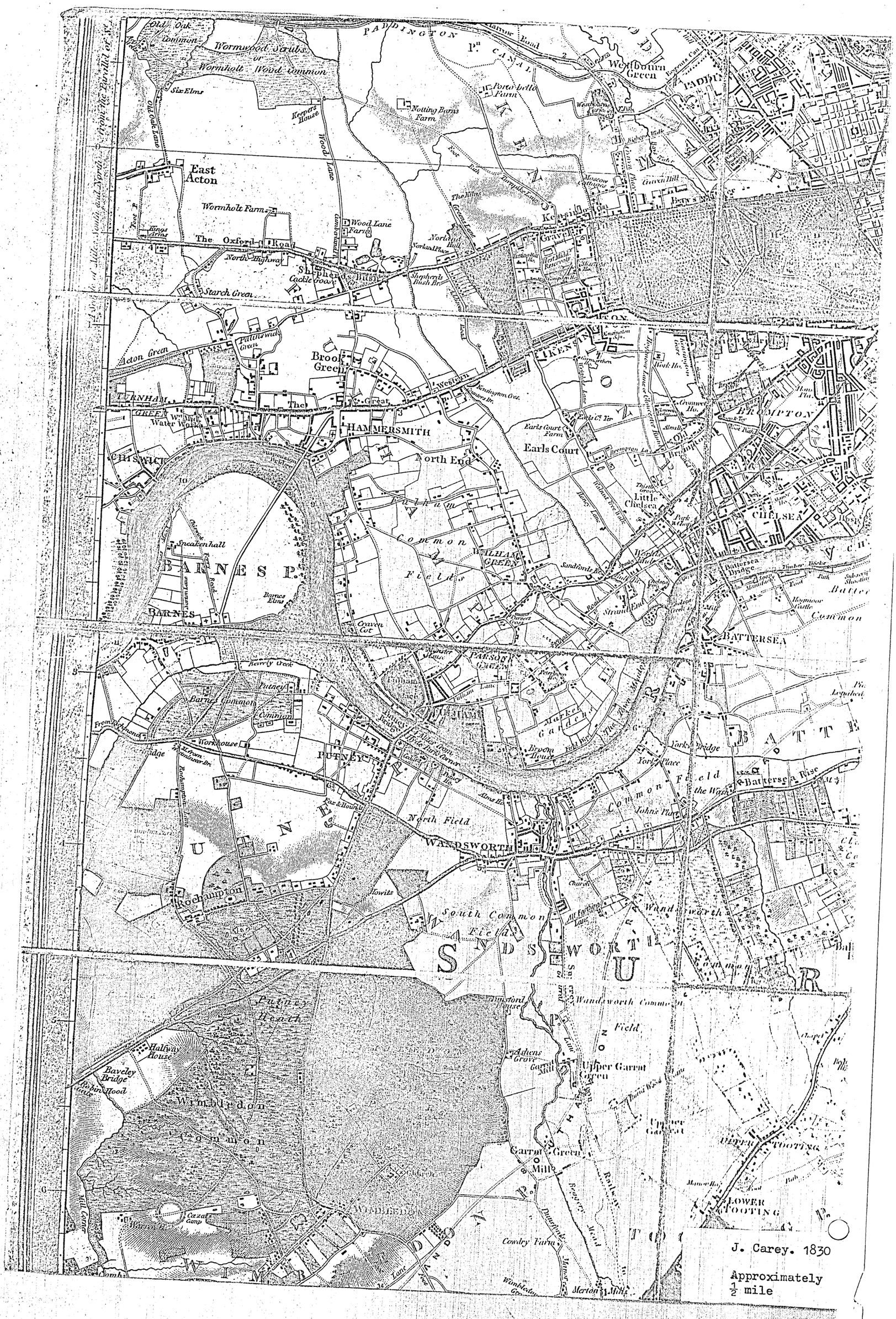
SOUTH-WESTERN RAILWAY.
LONDON TO SOUTHAMPTON.



Guide Map to the Line

Scale 5 miles to 1"


Neat House Gardens
Battersea Fields
Battersea New Town
Mill Pond
Vauxhall
Manor Ponds
Locks Fields
Windmill
Turnpike
Lower Way
Blue Anchor Road
Mill Field
Old Kent Road
Vauxhall Bridge Road
Vauxhall Walk
Vauxhall Bridge
Wandsworth Road
Nine Elms
Mill Bond Br.
Red House
Pavilion R.
Stockwell Ho.
Chelsea Water Works
Grosvenor Canal
Grosvenor Basin
Chelsea Basin
Ranelagh Gardens
Chelsea Hospital
Royal Military Asylum
Infirmary
Lambeth Marsh
Lambeth Palace
Lambeth Church
Lambeth Bridge
Lambeth Terrace
Lambeth Walk
Lambeth Butts
Lambeth Wells
Lambeth Common
Lambeth Road
Lambeth Workhouse
Lambeth Cut
Lambeth Pound
Lambeth Marsh



J. Carey. 1830

Approximately
½ mile

WIMBLEDON

Ordnance Survey
1865
Scale
1:10560
WIMBLEDON

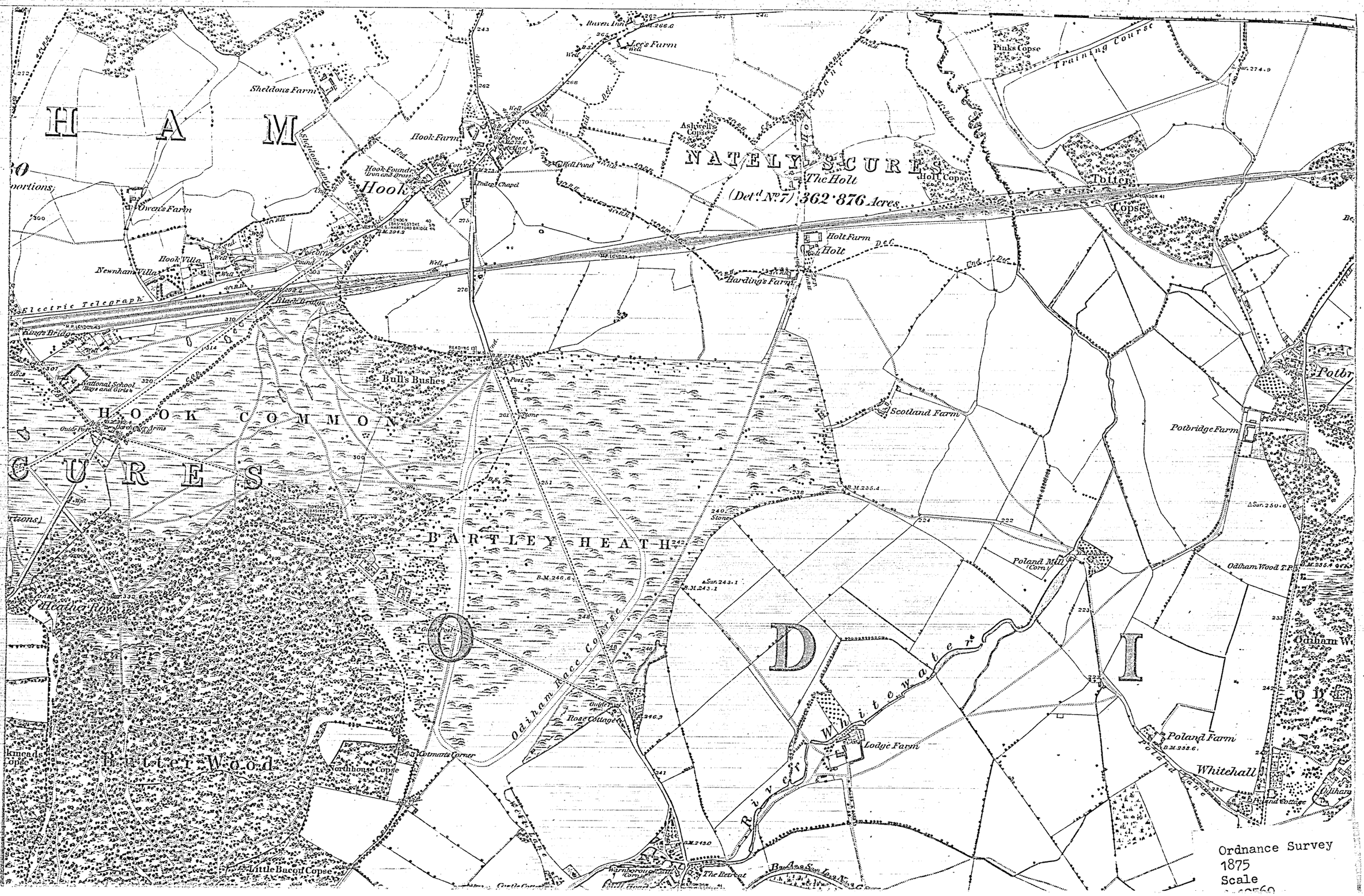

Vauxhall
The Elms
Surrey Cricket Ground
KENNINGTON PARK
Southwark & Vauxhall Water Works
St George's Ch.
Chemical Works
Area of TERSEA Acres 939·738 (A detᵗ portion) = 2.3.7.8.14.
Works
Mill Factory
Drill Shed
Chapel
Ch. Factory Ch.
Stockwell
Brixton & South London Line
Battersea
51°29'
Lat 51°28'
Ordnance Survey
1865
Scale
1:10560

Ordnance Survey
1865
Scale

Wanderings Farm
Mount Pleasant
Brick Field
Hopping Wood
New Malden
Gas Works
Lambeth Water Works
Bap.t Chap.l
Coombe and Malden Station
Electric Telegraph
Cambridge Road
Brick Field
Norbiton Common Farm
Lambeth Water Works
Lower Marsh Farm
Waitelands Farm
Brick Field
West Barnes Farm
West Barnes Park
Blagdon Farm
Dudlis Lodge
Ivy House
Bluehouse Farm
The Grange
Mostar Farm
Shiphouse Cottages
Newhouse Farm
Morden Co
Ordnance Survey
1871
Scale
1:10560


WEST BJ. THAMES WARD
KING
Surbiton
Surbiton Hill Park
Rifle Range
R. THAMES
RIVER
Chelsea Water Works
Seething Wells
Thames Ditton
Long Ditton
Giggshill
Rushett
Pound Farm
Berrylands
Berry Lodge Farm
The Parsonage
Christ Church
The Fish Ponds
Southborough Farm
Hampton Court Junction
St Leonard's Farm
Manor Farm
Hill Farm
Ordnance Survey
1871
Scale
1:10560
Surbiton

Ordnance Survey
1872
Scale
1:10560



Ordnance Survey
1875
Scale

Kirk Prewett Farm
Municipal Boundary
Well
B.M.368.2
B.M.367.7
C. R.
Guide Post
B.M.374.1
Sur.410.2
A
SEASTROP
(Dec.d No.3) 164·575 Acres
Sur.375.9
Municipal Boundary
Covered Reservoir
(Basingstoke Water Works)
Oakridge Farm
Well
Sur.360.8
Bolton Lodge
Stonehill Ho.
Sur.351.8
Sur.336.0
MONK SHERBORNE
(Dec.d No.1)
Acres
705·193
Chineham
Chineham Farm
B.M.322.8
B.M.332.0
M.P. LONDON 50
M.S. BASINGSTOKE 1
SOUTHAMPTON 31
READING 15
I
N
South View
Sur.350.3
Engine Shed
Engine Shed
Spoon Spring Well
Turnpike Ho.
Norn Hill
Gas Works
EASTROP
Mill Pond
Basingstoke Mill (Corn)
BASINGSTOKE CANAL
Liable to Flood
Goldings Farm
EASTROP
BASINGSTOKE
441·260 Acres
(includ.g 301·147 Arable pas.)
Clarence Tce
Chequers Close
Sur.316.7
BASINGSTOKE
COMMON
Black Rans
Hurtsfield
M.P. LONDON 49
Deep Lane Barn
River Loddon
Spring
Well
Queen's Prim. Grammar Sch. (Endowed)
Hatchfield Ho.
M.S. LONDON 46 (ANDOVER 18)
West Ham Ho.
B.M.312.9
Sur.321.9
M.S. LONDON 47 (ANDOVER 17) (BASINGSTOKE 1)
Lucklay Cottages
B.M.294.2
Victoria Tce
The Mount
Cattle Market
The Folly (Cricket Ground)
Prospect Cottages
Goldfield Ho.
Hawkefield
LONDON 46 M.S. (STOCKBRIDGE 21)
South Ham Farm
S I N G S T O K E
Ordnance Survey
1877
Scale
1:10560
BASINGSTOKE

WANDSWORTH

WEST HILL

WANDSWORTH

SOUTH FIELDS

WANDSWORTH

COMMON

WIMBLEDON PARK

EARLSFIELD

PUTNEY

GARRATT

ROYAL HOSPITAL (Chelsea)

Holy Trinity Ch.

Ravenswood

Melrose Gardens

Cliff Lodge

Leg of Mutton Hill

Edgecumbe Hall

Southmead

Torwood

Urmston Lodge

Flory's

Struan

Glenshero

Mortimer Lodge

Levana Ho.

Oaklee

Allenswood

Amblaside

Oaklands

Fernwood

Lake Farm

Surface of Water 67·83 27th. June 1894

Wimbledon Park Lake

Ashen Grove Wood

Ashen Grove Farm

Ashen Grove

Union & Parly. Boro. By.

U.D. By.

WIMBLEDON & PULHAM L.S.W.R.

Southfields Station

Wandle Ho.

Royal Paper Mills

Wandle Colour Works

Mill Dam

Mills

Smithy

Vicarage

Church

Chap.

Ibbott Lodge

Schools

Workhouse

Nursery

Mission Ch.

School

Mission Hall

Chemical Manure Factory

Riversdale Wks. (Firework)

Putnshill Mills

Soap Works

Earlsfield & Summers Town Station

St. Andrew's Church

Garratt House

Mills

Burntwood Farm

Springfield Farm

Mill Pond

GARRATT GREEN

Infirmary

Chapel

ROYAL VICTORIA PATRIOTIC ASYLUM

Lodge

The Farm

Linden Lodge

Nursery

HER MAJESTY'S PRISON

CEMETERY

Chapel

Lodge

Vicarage

Burntwood Playing Field

Burntwood Grange

Cullamore

Burntwood Lodge

Lodge

Church

Industrial School

Lodge

Chapel

Infirmary

COUNTY LUNATIC ASYLUM (Middlesex)

Wandsworth Common Station

Tramway

LONDON & SOUTH WESTERN RAILWAY

WEST END & CRYSTAL PALACE L.B.&S.C.R.

GRANVILLE ROAD

EARLSFIELD ROAD

LYTTELTON ROAD

EDITHNA ROAD

MACDONELL ROAD

Area 2490·325 Acres

VII. S.W. SURREY. VII. S.E.

0° 12'

LONDON....XIV. N.E.

0° 11'

LON. 0° 10' W.

ION WIMBLEDON U. D. WIMBLEDON PH.

NORTH-EASTERN or WIMBLEDON DIVISION, SURREY.

RISTICS AND SYMBOLS.

of

direction of flow of water

Telegraphic Station

Price Is.

Scale—Six Inches to One Statute Mile or 880 Feet to One Inch—1:10560

10 Chains 5 0 10 20 30 40 50 60

40 Perches 20 0 40 80 120 160 200 240

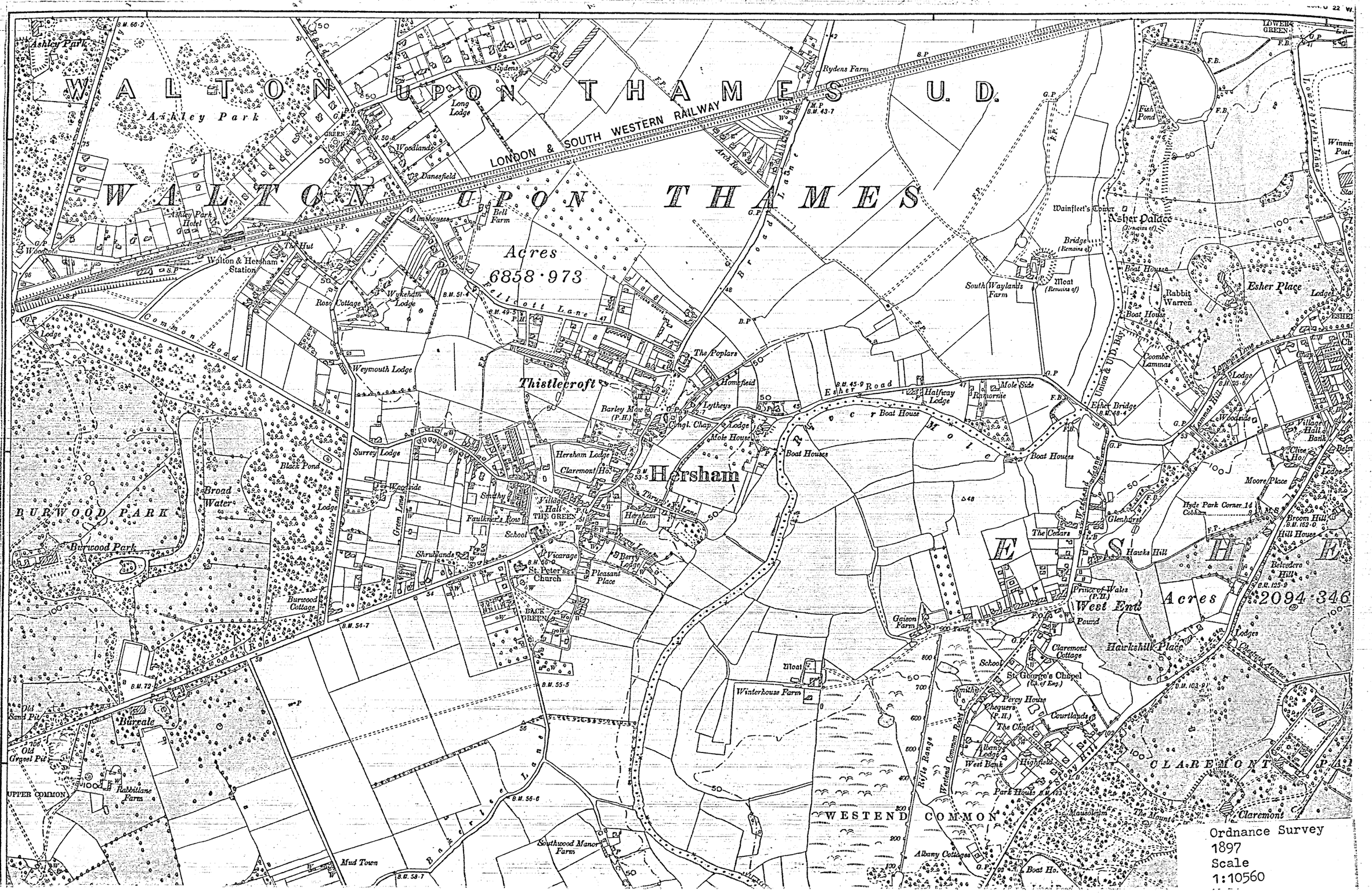
1000 Feet 500 0 1000 2000 3000 4000

Ordnance Survey
1894
Scale
1:10560


WESTMINSTER
CHELSEA
BATTERSEA
LAMBETH
R I V E R T H A M E S
Parly. Co. Union & Parly. Boro. By.
Chelsea Suspension Bridge
Victoria Bridge
Vauxhall Bridge
Grosvenor Rd Sta.
Vauxhall Sta.
Pier
Church
Mud
Goods Depot
Site of Gunboat Stairs
DRAW DOCK
Mill
LOCK
DOCK
Distillery
Filtering Beds
Reservoir
Southwark & Vauxhall Water Works
Match Ground (Cricket)
Battersea Park Rd
Inc. Elms Wks.
Vicarage
Public Library
Polytechnic Institute
Queens Rd. Sta.
Hall
Mission Room
Goods Depot (Midland Ry.)
Goods Sta.
Wandsworth Rd Station
Schools
Stockwell Sta. (Loc. Ry.)
Orphandge
College
VAUXHALL PARK
Surrey Cricket Ground
Pavilion
Baths
St. Peter's House
Ordnl. Sta.
KENNINGTON PARK
Head Qrs. (1st. Surrey R. V.)
MYATT'S FIELDS
Brixton & Parly. Boro.
L.C.&D.R.
Ordnance Survey
1894
Scale
1:10560

College Copse
Hill Copse
Sheldon's Farm
Nursery
Hook Farm
Hook Foundry
Sheldon's Lane
W I N H A M
A c r e s
1 4 0 4 4 5 8
Hooklands Farm
Hook
Chapel
Smithy
Raven Inn
Lee's Farm
Hartletts
Ashwell's Copse
White Hart (P.H.)
The Holt
Holt
Holt Copse
Pinks Copse
Liddedo Floods
Totter
Copse
Sand Pit
LONDON & SOUTH WESTERN RAILWAY
Station
Holt Farm
Union Bdy.
Harding's Farm
Hook Villa
Orotava
Kingsbridge Copse
Black Br.
Kings Br.
Union Bdy.
Bull's Bushes
School
Dorchester Arms (P.H.)
HOOK COMMON
S C U R E S
2 0 8 6 8
Gaine's Wood
BARTLEY HEATH
Golf Course
Carleton's Gorse
Gravel Pit
Old Gravel Pit
Butter Wood
Cotman's Corner
Northhouse Copse
Hickmeads Copse
Scotland Farm
Lodge Farm
Ford
Ford Spring
Poland Mill
Poland Farm
Whitehall
River Whitewater
Potbridge Farm
Meth. Chap.
Oldham
Union Bdy.
B.M. 319·4
B.M. 294·2
B.M. 274·9
B.M. 235·9
B.M. 224·6
B.M. 245·6
B.M. 245·5
B.M. 248·2
B.M. 245·7
B.M. 243·0
B.M. 233·6
M.S. Basingstoke 6, Bagshot 13
M.S. Reading 13, Odiham 2
M.S. Basingstoke 5, Odiham 2

Ordnance Survey
1897
Scale
1:10560


WALTON UPON THAMES U.D.
WALTON UPON THAMES
Ashley Park
LONDON & SOUTH WESTERN RAILWAY
Ashley Park Hotel
Walton & Hersham Station
Woodlands
The Danesfield
Long Lodge
Rydens
Rydens Farm
Arch Road
Broad Lane
Almshouses
Bell Farm
Acres
6858·973
Ellicott Lane
Wykeham Lodge
Rose Cottage
The Hut
Common Road
Weymouth Lodge
Thistlecroft
The Poplars
Homefield
Barley Mow (P.H.)
Lytheys
Cmgl. Chap.
Mole House
Boat Houses
Halfway Lodge
Ramornie
Mole Side
Esher Road
Esher Boat House
Hersham
Hersham Lodge
Claremont Ho.
Thrupp's Fm. Lane
Village Hall
THE GREEN
Faulkner's Row
School
Vicarage
St. Peter's Church
Pleasant Place
Hersham Ho.
Percy Lodge
Shrubbands
Smithy
Woodside
Surrey Lodge
Green Lane
Western Lane
Black Pond
Broad Water
BURWOOD PARK
Burwood Park
Burwood Cottage
Burwood Road
Old Sand Pit
Old Gravel Pit
Burvale
Rabbitlane Farm
UPPER COMMON
Basingstoke Lane
Mud Town
Southwood Manor Farm
Winterhouse Farm
Moat
Gaison Farm
Pound
West End
Prince of Wales (P.H.)
Claremont Cottage
School
St. George's Chapel (Ch. of Eng.)
Percy House
Chequers (P.H.)
The Chalet
Courtlands
Albany Lodge
West Bank
Highfield
Park House
Mausoleum
The Mount
Claremont
Rifle Range
Weybridge Common Road
WESTEND COMMON
Albany Cottages
Boat Ho.
Wainfleet's Tower
Esher Palace
(Remains of)
Bridge
(Remains of)
Moat
(Remains of)
South Waylands Farm
Fish Pond
Boat House
Rabbit Warren
Esher Place
Lodge
Coombe Lammas
Lammas Lane
Esher Bridge
Village Hall & Bank
Moore Place
Hyde Park Corner
Glenhurst
The Cedars
Broom Hill
Hill House
Hawks Hill
Belvedere Hill
Hawkshill Place
Lodges
Chateau Annexe
Acres
2094·346
Ordnance Survey
1897
Scale
1:10560

BASINGSTOKE

BASINGSTOKE MUNL. BORO.

BASINGSTOKE PH.

XVIII. S.E.

1°6′ From Winchester

1°5′ From Preston Candover

LON. 1°4′ W.

LONDON & SOUTH WESTERN RAILWAY

READING & BASINGSTOKE G.W.R.

BASINGSTOKE CANAL

River Loddon

Liable to Floods

Old Chalk Pit

Soldiers Return (B.H.)

BASING (Detached)

St. Thomas' Diocesan Home

Reservoirs

Sherborne House

Merton Farm

SOUTH VIEW

Munl. Bdy.

Bolton Lodge

Nornhill House

(Detached No 1)

Reading....15
Basingstoke..1 M.S.

B.M. 332·0

Basingstoke Union Workhouse

a. Eastrop Ph.
Acres 22·578

Gas Works

Sewage Works

Mill

Liable to Floods

Upper Mill

Mill Head

Black Dam

Lower Fish Pond

Upper Fish Pond

Munl. Bdy.

Ruetstall's Hill

BASINGSTOKE COMMON

GOLDINGS PARK

Goldings

Eastlands

White Hart (P.H.)

Horse & Jockey (P.H.)

Pleasant

Lynton

Chapel

Eastrop House

St. Mary's Ch.

Eastrop Farm

Eastrop Bridge

Basingstoke Wharf

Foundry

Rectory

St. Michael's Ch.

Pall Terrace

Mission Room

Hospital (Infectious Diseases)

Engine Shed

Goods Shed

Phœnix Park Terrace

R.C. Chapel

CEMETERY

Rising Sun (P.H.)

Saw Mill

Deep Lane Barn

Deep Lane

Queen's Grammar School (Endowed)

Highfield House

West Ham House

Lodge

Downsland

Brambly's

Shaftesbury Terrace

The Mount

The Cedars

May's Bounty

School

Ashley Lodge

Hawkfield

South Ham Farm

Chapel

Pall

Sun. Sch.

Old Mill

Dairy

Farm

Sherborne Road

Richmond Road

Caldwell Road

Winchester Road

Southern Road

London 46
Stockbridge 21 M.S.

London 46
Andover 18 M.S.

B.M. 368·0

B.M. 367·7

B.M. 373·4

B.M. 297·5

B.M. 286·0

B.M. 335·2

B.M. 323·3

B.M. 294·6

B.M. 265·2

B.M. 290·9

B.M. 274·0

B.M. 289·6

B.M. 310·5

B.M. 312·6

B.M. 294·2

B.M. 304·4

M.S. London 46
B.M. 257·5

Price 1s.

Heliozincographed from 1/2500 Plans and Published at the Ordnance Survey Office, Southampton.

Scale—Six Inches to One Statute Mile or 880 Feet to One Inch = 1/10560

10 Chains 5	0		10	20	30	40	50	60
40 Perches 20	0		40	80	120	160	200	240
1000 Feet 500	0		1000	2000	3000	400		
1 Furlong 0				¼	½	¾	1	

N.B.—The representation on this map of a Road, Track, or Footpath, is no evidence of a

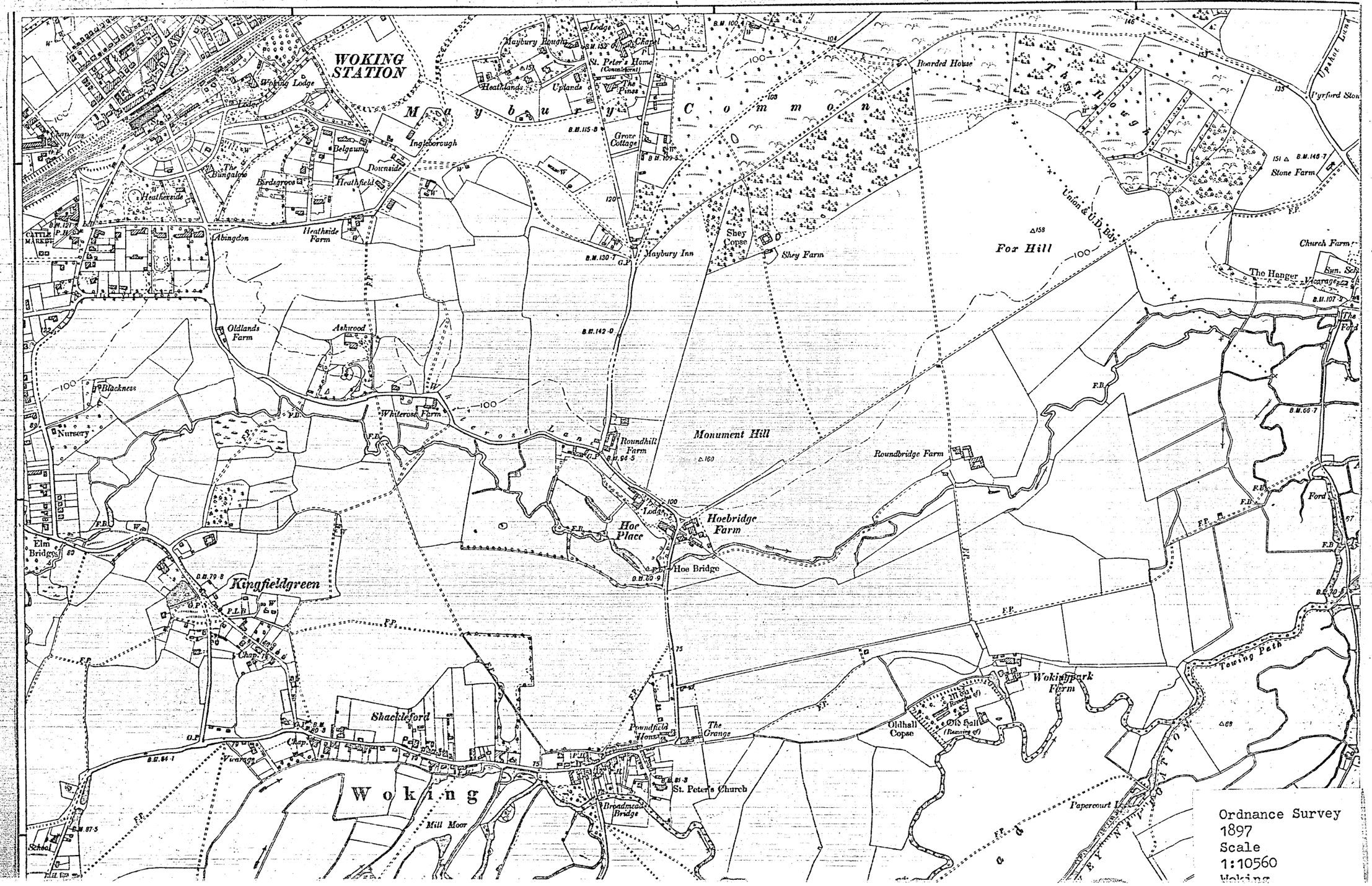
ISTICS AND SYMBOLS.

of.....+

direction of flow of water ....→

Trigonometrical Station .....△

Ordnance Survey
1897
Scale
1:10560


WOKING STATION
Maybury Common
Maybury Lodge
Maybury Chapel
St. Peter's Home
(Convalescent)
Heathlands
Uplands
The Pines
Grove Cottage
Boarded House
The Rough
Upshot Lane
Pyrford Stone
Stone Farm
Woking Lodge
Inglesborough
Belgaum
Dovenside
Heathfield
Birdsgrove
The Bungalow
Heatherside
Abingdon
Heathside Farm
CATTLE MARKET
Maybury Inn
Shey Copse
Shey Farm
Fox Hill
Union & C.D. Dby.
Church Farm
The Hanger
Vicarage
Sun. Sch.
The Ford
Oldlands Farm
Ashwood
Blackness
Nursery
Whiteross Farm
Roundhill Farm
Monument Hill
Roundbridge Farm
Lodge
Hoe Place
Hoebridge Farm
Hoe Bridge
Elm Bridges
Kingfieldgreen
Chap.
Shackleford
Poundfield House
The Grange
Oldhall Copse
Old Hall
(Remains of)
Woking Park Farm
Towing Path
Papercourt Lock
Woking
St. Peter's Church
Broadmead Bridge
Mill Moor
School
Hill
Ford
Ordnance Survey
1897
Scale
1:10560
Woking

Ordnance Survey
1897
Scale
1:10560
Byfleet

MALDEN AND COOMBE

NEW MALDEN

MALDEN

Acres 1040·731

Acres 842·026

New Malden

Coombe & Malden Station

Trinity Church

Meth. Chap.

Baptist Chapel

Congl. Church

Police Station

Cricket Ground

Sun. Sch.

Manse

Amblesde

Cromwell House

Cromwell Avenue

Fairholme

Norbiton Park Farm

Norbiton Pottery

Norbiton Common Farm

Norbiton Lodge

Cambridge Lodge

Mission Room

Nursery

Gravel Pit

Old Gravel Pit

Tanks

Brick Field

Dickerage Farm

Dickerage Lane

Mount Pleasant

Hoppingwood Farm

Victoria

Ravenhurst

Penvarn

Parkhurst

Merivale House

Ercildun

Chirnside

Woodfield

Oakfield

Coombefield

Radnor House

Wilton House

The Firs

Elmhurst

Firgrove

The Alders

The Broadlands

Motspur Park

Motspur Farm

The Grange

The Rookery

Bluehouse Farm

Bluehouse Cottages

Newhouse Farm

Sheephouse Cottages

Holy Maldon Lane

Coombe Lane

Bluehouse Lane

Blagdon Road

Burlington Road

West Barnes Lane

West Barnes Farm

West Barnes Terrace

Blagdon Farm

Railway Cottages

Well

Raynes Park

Cumberland Lodge

Greenville House

Penninghame

Cricket Ground

Hardwicke House

Vallis Leaze

Sonnenthal

Lynz House

Inverness House

Penlee

Blenheim

Blenheim Road

Queen Anne House

Concrete Cottage

Golf Course

Grand Drive

Dudley Lodge

Garfield House (Boys' Home)

East Cottage

West Cottage

Mort. Chaps.

BATTERSEA NEW CEMETERY

Morde

L. & S. W. R. KINGSTON LINE

L. & S. W. R. WIMBLEDON & EPSOM LINE

LONDON & SOUTH WESTERN RAILWAY

Parly. Co. Div. By.

Parly. Co. Div. Union & U.D. By

Ordnance Survey
1898
Scale
1:10560

EDITION OF 1914.

GSTON-UPON-THAMES
(CNL. BORO. & PH.
17' W.

KINGSTON DIVISION

0°16'

COOMBE PH.

KINGSTON UNION

0°15'

VII. S.W.

0°14'

NORTH EASTERN OR

NEW MALDEN

RAYNES

NEW MALDEN

THE MALDENS AND COOMBE U.D.

M A L D E N

MER

Wanderings Farm
Dickerage Farm
Mount Pleasant
Hoppingwood Farm
Sports Ground
Pavilion
School
Mission Church
Sewage Works (The Maldens & Coombe U.D.C.)
Kingston Union Farm
NORBITON COMMON
Disposal Works (Norbiton U.D.C.)
Fairholme
Cricket Ground
Pavilion
Police Station
Norbiton Pottery
Schools
Mission Church
Congregational Church
Kilns
Ford
Hogsmill River
Seed Testing Station
Railway Cottages
Club House
Sunday School
St. Saviour's Church
Sewage Pumping Station (Merton U.D.C.)
West Barnes
Blagdon Farm
West Barnes Farm
Saltdra
Blenheim
Inverness House
Pentee
Queen Anne House
Golf Course
Concrete Cottage
WEST BARNES
Dudley Lodge
Ivy House
East Cottage
West Cottage
Bluehouse Farm
Bluehouse Cottages
Sewage Pumping Station (The Maldens & Coombe U.D.C.)
Coombefield
Oakfield
Willow House
Elmhurst
The Rookery
Firgrove
Motspur Farm
Vorwood
Lodge
The Broadlands
Motspur Park
Polo Ground
Wimbledon Shooting Grounds
Nrchouse Farm
Beverley Brook
Beverley Brook Valley
BEVERLEY PARK
The Grange
Dudley Lodge
Mortuary Chapels
BATTERSEA NEW CEMETERY
Green Lane
Parly. Co. Div. By.
U.D. By.
L. & S.W.R. KINGSTON LINE
L. & S.W.R. WIMBLEDON & EPSOM LINE
LONDON & SOUTH WESTERN RAILWAY
KINGSTON BY-PASS ROAD
Ordnance Survey
1914
Scale
1:10560

Ordnance Survey
1919
Scale
1:10560
Surbiton

ASHLEY PARK LON. 0° 25' W. WALTON UPON THAMES 0° 24' MID OR EPSOM DIVISION XII. N. W. 0° 23' MAP BOOK

WALTON UPON THAMES U.D.

WALTON UPON THAMES

ASHLEY PARK

LONDON & SOUTH WESTERN RAILWAY

30"

LAT. 51° 22'

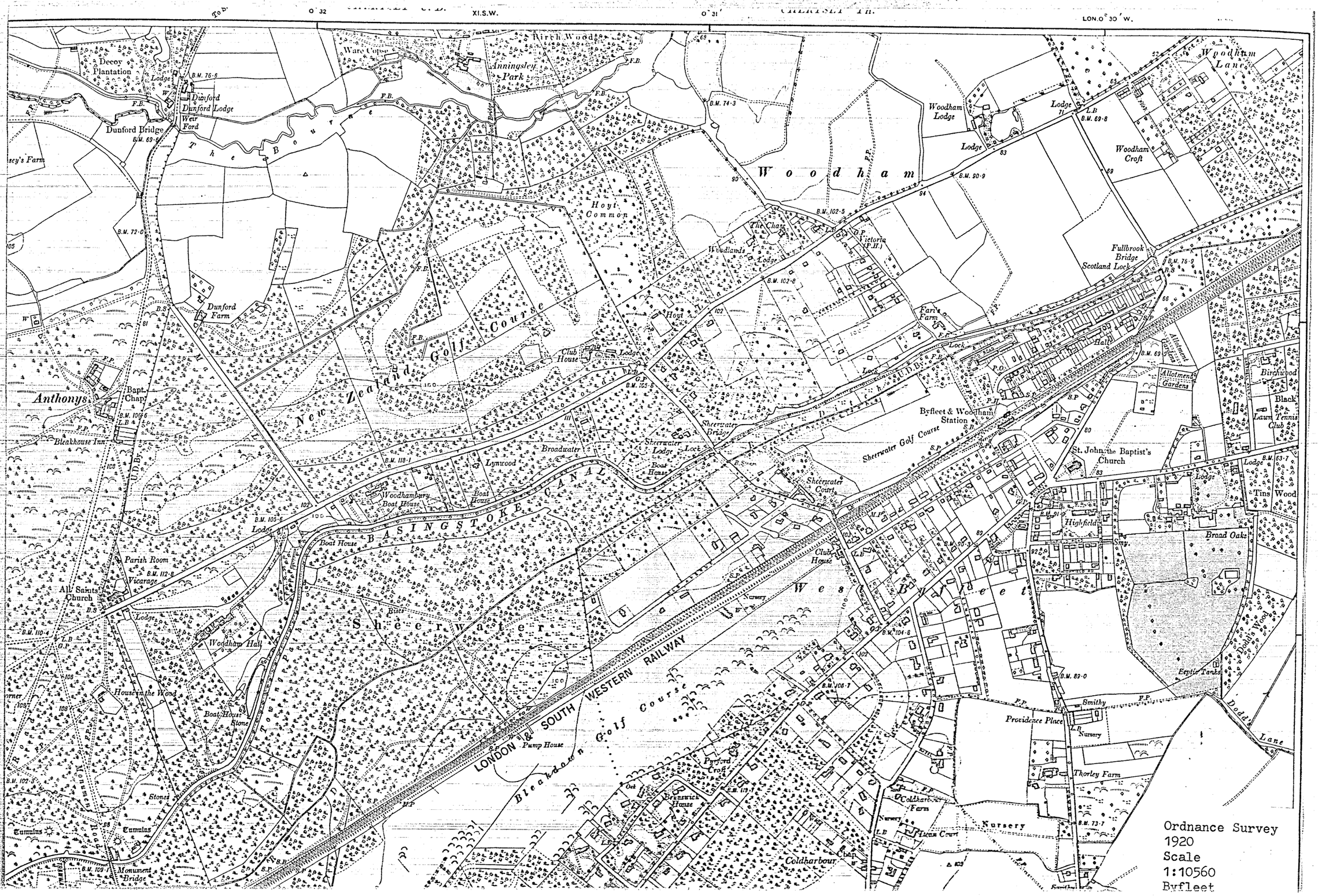
XI. S. E.

CHERTSEY UNION

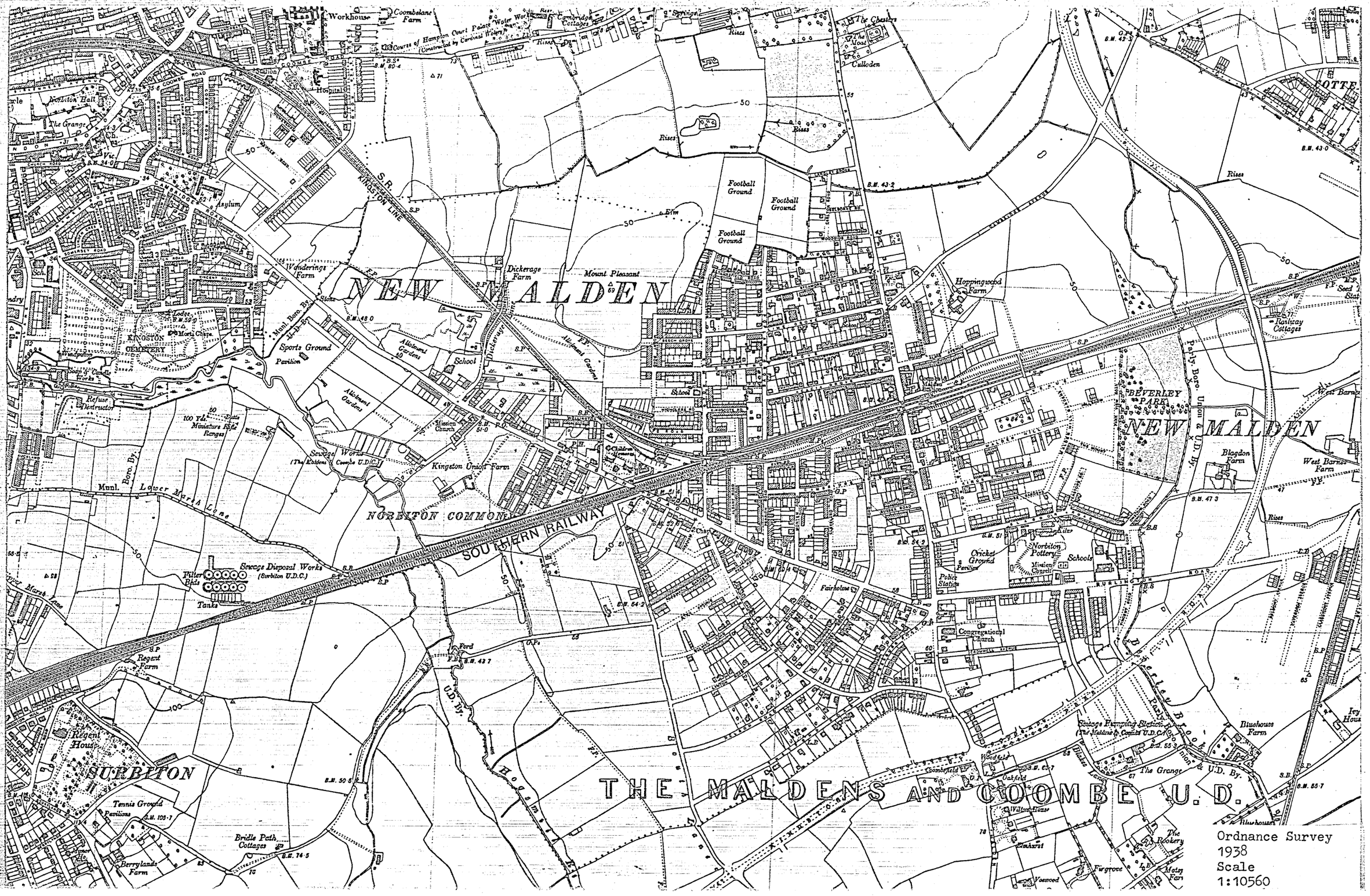
30"

Ashley Park B.M. 66·5 B.M. 49·5 B.M. 77·9 B.M. 56·5 B.M. 76·0 B.M. 52·2 B.M. 51·5 B.M. 49·6 P.H. B.M. 50·3 B.M. 45·5 B.M. 44·2 B.M. 72 B.M. 80·9 B.M. 53·5 B.M. 53 B.M. 53·6 B.M. 54·5 B.M. 55·4 B.M. 57·8 B.M. 72·8 B.M. 57·0 B.M. 46·0 B.M. 49·9 B.M. 47·7 B.M. 69·2 B.M. 110·6 B.M. 125·9 B.M. 96·9 B.M. 92·3

Woodcote Ashley Park Hotel Allotment Gardens Cleveland Lodge The Bush Bell Farm Almshouses Tennis Ground Walton & Hersham Station The Hut Tank Allotment Gardens Queens Road Lodges Rokemead THISTLECROFT White Ho. Woodlands Bramley Dene Gold Lodge Long Lodge Rydens Rydens Farm Allotment Gardens Waylands Sewage Works (Walton upon Thames U.D.C.) Rises Fish Pond Waterer's Tomb Remains of Asher's Palace Boat House Rabbit Warren Esher Place South Waylands Farm Longmore Farm Homefield Post Ramornie Mole Side Halfway Lodge Pont Houses Boat Houses Esher Bridge Woodside Coombe Lammas Moore Place Hill House Belvedere Glenhurst Hawks Hill The Cedars Allotment Gardens Nursery Prince of Wales (P.H.) Pound West End Gaison Farm Infant School Rises St. George's Chapel Claremont Cottage Courtlands Hersham Lodge The Cottage Claremont House Hersham House The Hurst Thurrum Lane Lytheys Darley Mote (P.H.) Congregational Chapel Mole House Lodge Allotment Gardens Surrey Lodge Shuttlands Black Pond Rises Shrublands School Vicarage Yew Side Pleasant Place St. Peter's Church Police Station BACK GREEN THE GREEN Burwood Cottage Burwood Park Burvale Rabbitlane Farm Upper Common (Allotment Gardens) Nursery Southwood Manor Farm Balkiny Place Stage Mud Town Lane Hersham Road Burwood Park Broad Water Winterhouse Farm Boat Houses Boat House Mole Road Rises Lodges Chestnut Avenue Claremont Common Road Westend Lane Park House Mausoleum Mole Side Union & U.D. Dyke Lammas Lane Esher Green Thames Ditton Woodside Ho. Meth. Ho. Lodge Ho. Lodge Ho. Lodge

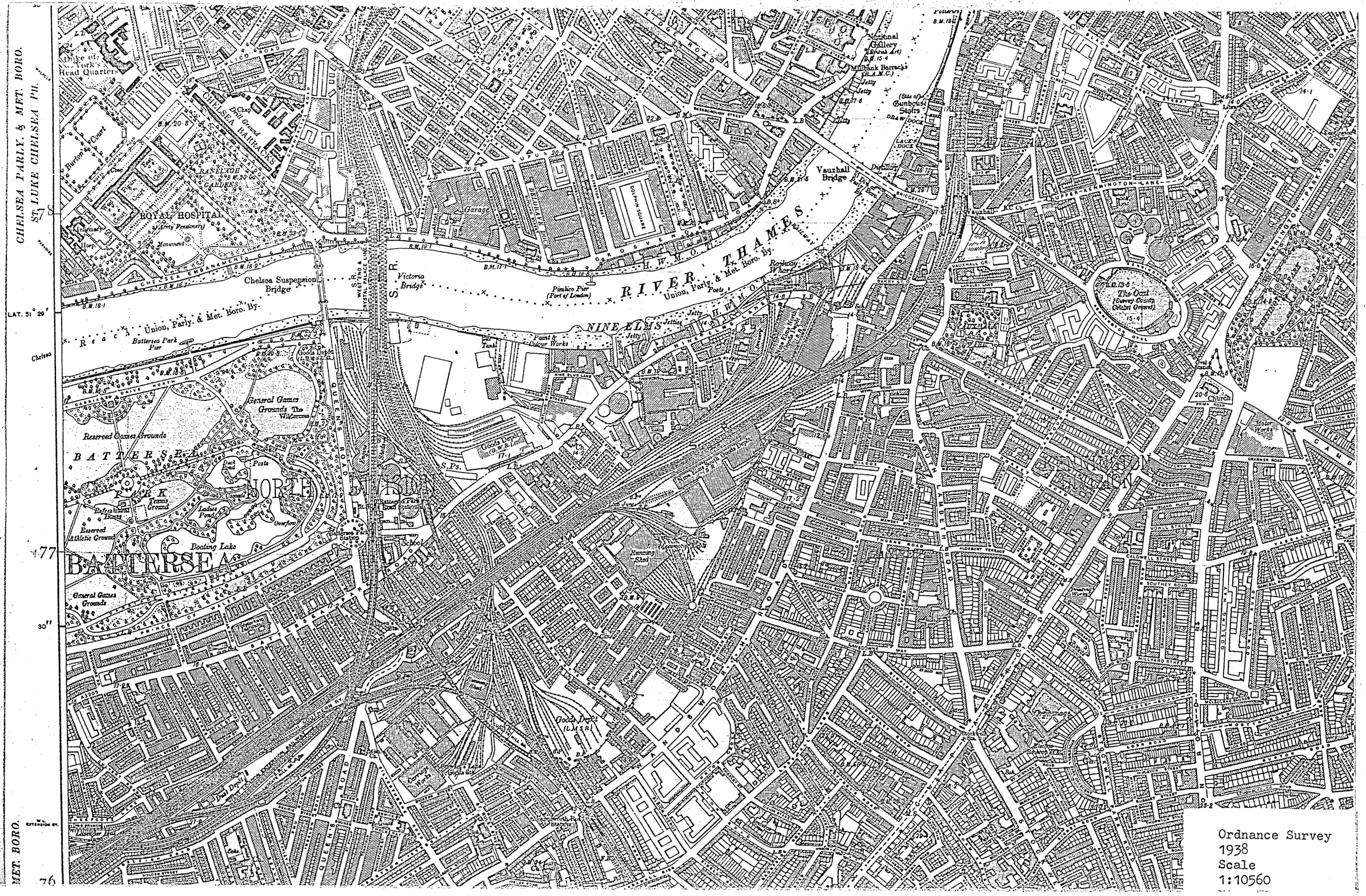

XI.S.W.
LON. 0° 30' W.
Decoy Plantation
Dunford
Dunford Lodge
Weir Ford
Dunford Bridge
The Bourne
Ware Copse
Birch Wood
Anningsley Park
Woodham
Woodham Lodge
Woodham Croft
Woodham Lane
Hoyt Common
The Chase
Victoria (P.H.)
Woodlands Lodge
Fullbrook Bridge
Scotland Lock
Dunford Farm
New Zealand Golf Course
Club House
Hoyt
Farr Farm
Lock
Hall
Allotment Gardens
Anthonys
Bapt. Chap.
Bleakhouse Inn
Byfleet & Woodham Station
Sheerwater Golf Course
St. John the Baptist's Church
Birchwood
Black Lawn Tennis Club
Tins Wood
Broad Oaks
Sheerwater Bridge
Sheerwater Lock
Boat House
Broadwater
Lynwood
Woodhambury Boat House
BASINGSTOKE CANAL
Sheerwater Court
Parish Room
Vicarage
All Saints' Church
Woodham Hall
Sheerwater
Club House
West Byfleet
Highfield
Smy.
Dodd's Wood
Septic Tanks
Smithy
Providence Place
Nursery
Thorley Farm
Dodd's Lane
House in the Wood
Boat House
Stones
Tumulus
Monument Bridge
LONDON & SOUTH WESTERN RAILWAY
Bleakhouse Golf Course
Pump House
Pyrford Cross
Brenswick House
Coldharbour Farm
Coldharbour
Pucas Court
Ordnance Survey
1920
Scale
1:10560
Byfleet

Ordnance Survey
1920
Scale
1:10560
Woking


NEW MALDEN
THE MALDENS AND COOMBE U.D.
SURBITON
NORBITON COMMON
SOUTHERN RAILWAY
KINGSTON CEMETERY
Workhouse
Coombelane Farm
Course of Hampton Court Palace Water Works (Constructed by Cardinal Wolsey)
Cambridge Cottages
Springs
The Chestnuts
The Moat
Culloden
Rises
Football Ground
Asylum
Wanderings Farm
Dickerage Farm
Mount Pleasant
Elm
Hoppingwood Farm
Railway Cottages
Beverley Park
Lodge
Mort. Chpl.
Sports Ground
Pavilion
Allotment Gardens
School
Mission Church
Refuse Destructor
100 Yds. Miniature Rifle Ranges
Sewage Works (The Malden & Coombe U.D.C.)
Kingston Union Farm
Lower Marsh Lane
Munl. Boro. By.
Sewage Disposal Works (Surbiton U.D.C.)
Filter Beds
Tanks
Regent Farm
Regent House
Tennis Ground
Pavilions
Bridle Path Cottages
Berrylands Farm
Ford
U.D. By.
Hogsmill R.
Fairhouse
Cricket Ground
Pavilion
Police Station
Norbiton Pottery
Schools
Mission Church
Congregational Church
Sewage Pumping Station (The Malden & Coombe U.D.C.)
Bluehouse Farm
The Grange
Oakfield
Elmhurst
The Rookery
Firgrove
Yewood
Blagdon Farm
West Barnes Farm
Ordnance Survey
1938
Scale
1:10560

CHELSEA PARLY. & MET. BORO.

ST. LUKE CHELSEA PH.


Duke of York's Head Quarters
CHELSEA BARRACKS
Drill Ground
Burton's Court
Chap.
ROYAL HOSPITAL
(Army Pensioners)
Infirmary
Hosp.
Monument
Fulham Court
Wren Court
CHELSEA EMBANKMENT
Chelsea Suspension Bridge
S.R. WEST END & CRYSTAL PALACE LINE
Victoria Bridge
RIVER THAMES
Union, Parly. & Met. Boro. By.
H.W.M.O.T.
Pimlico Pier (Port of London)
Reach
Battersea Park Pier
Goods Depot (G.W.R.)
Paint & Colour Works
NINE ELMS
Jetty
Pier
Tank
Goods Depot (L.M.S.R.)
Coaling Wharf
Engine Shed
Running Shed
Loco. Shed
Goods Depot
Goods Office
Carting Yard
Dust Destr.
Sub Sta.
Ladies Pond
Boating Lake
Tennis Ground
Refreshment Houses
Reserved Athletic Ground
General Games Grounds
Reserved Games Grounds
General Games Grounds The Wilderness
BATTERSEA PARK
BATTERSEA
QUEENSTOWN ROAD
Chelsea
LAT. 51° 29'
77
30"
76
National Gallery (Extnsn Art)
Millbank Barracks (R.A.M.C.)
(Site of) Gunboat Slips
DRAWDOCK
LAKE & DOCK
Vauxhall Bridge
BRIDGE ROAD
Vauxhall
Vauxhall Gdns
Vauxhall Cross
Vauxhall Br. Rd.
Railway Wharf
Jetty
Pumping Station
Tanks
Gas Works
Motor Works
Church
Prima Road
Drawbridge
Lock
Basin
Dock
Wharf
Sluice
Pier
Ferry
Ferry Steps
Ferry Boats
Ferry Pier
Ferry Landing
Ferry Slip
Ferry Stairs
Ferry Wharf
Ferry Boat
Ferry Boat Slip
Ferry Boat Stairs
Ferry Boat Wharf
Ferry Boat Landing
Ferry Boat Pier


FULHAM
PARSONS GREEN
Parsons Green
PARSON'S GREEN
Christ Church
School
Hurlingham Lodge
Hurlingham Field Cottage
Polo Ground No. 2
Polo Ground No. 1
Cricket Ground
South Park
(Recreation Ground)
Hurlingham Club Grounds
Lodge
Elizabethan Schools
Parsons Green Club
Hurlingham House
Broom House Dock
X.Y.Z. Wharf
West Wharf
Floating Pier
Stephendale Works
Imperial Wharf
Trinidad Asphalt Wks.
Britannia Wharf
Regina Wharf
Belmont Works
Skell Wharf
Southampton Wharf
Gloster Wharf
Sherwood Wharf
Wharves
Wandsworth Distillery
Wandsworth Bridge
CHELSEA BASIN
Battersea Wharf
Vicarage Wharf
Albion Wharf
St. John's Training College
Falcon Wharf
Battersea Bridge
Battersea Park Road
Reform St.
Prince of Wales Drive
Lavender Hill
Drill Hall
Battersea Rise
St. Mary's Church
St. Mary's Cemetery
Chapel
Lodge
WANDSWORTH PARK
Coal Depot
Slip
Wharves
Bond Store
Wandsworth Park
Junction Line
Convent of the Sacred Heart
Ram Brewery
Wandsworth Gas Works
Gas Holder
Gas Works
Wandsworth Common Sewer
Storm Relief Sewer
Wandsworth Common
Spencer Park
Cricket Ground
Elementary School
Royal Victoria Patriotic School
Orphan Daughters of Soldiers
Ordnance Bm.
(Ht. Ardglass's Board)
Ordnance Survey
1938
Scale
1:10560


WANDSWORTH
WEST DIVISION
WANDSWORTH
COMMON
SPENCER PARK
Royal Victoria Patriotic School
HIS MAJESTY'S PRISON
WANDSWORTH CEMETERY
Summerstown Football Ground
Old Leppans Football Ground
COUNTY LUNATIC ASYLUM (Middlesex)
Cricket Ground
Neal's Farm
Nursery
Cricket Ground
Heathfield Club (Sports Ground)
Surrey Tavern (P.H.)
Holy Trinity Church
ROYAL HOSPITAL
Leg of Mutton Hill
SOUTHFIELDS
DURTSHILL
Southfields Station
Polo Ground
WIMBLEDON PARK
Wimbledon Park Lake
Garratt Park
Garratt Green
Recreation Ground
Allotment Gardens
Cricket & Lawn Tennis Ground
Cricket Ground
Bowling Green
Grand Stand
Pavilion
Lodge
Nursery
Stone
Water Tower
Church
Hospital
Sch.
Sch.
Sch.


POND
Fish Pond
Wimbledon Park House
Old Rectory House
Church
St. Mary's
Ricards Lodge
Fieldhead
Beaulieu
Fairmead
Oaklawn
St. Brendans
Queen Alexandra's Court
Draxmont
Wailana
Marryn Houses
Smallpox Hospital
Sewage Works
Sewage Tank
Mills
Mill Dam
Allotment Gardens
Johnston Memorial
Mort. Chapel
Mortuary
Lodge
CEMETERY
Stadium
Weirscress Beds
Lambeth Cemetery
Mortuary Chapel
Lodges
Fountain Hospital
Tooting Schools
GROVE HOSPITAL
Tooting, Merton & Wimbledon Line
S.R.
Laundry
Tooting & Merton Brick Works
Recreation Ground
Wandle Park House
WANDLE PARK
Weir
Mill Pond
Sun. Sch.
Christ Church
COLLIERS WOOD
Merton Abbey Works
Merton Abbey Station
Merton Abbey Silk Printing Works
Stones
Smallberry Works
Varnish & Japan Works
Varnish Factory
Leather Factory
Iron Works
Bridgefield Varnish Works
Japan & Varnish Works
Japan & Varnish Factory
Phipps Bridge
Aqueduct
River Wandle
U.D.B.
WIMBLEDON COLLEGE (R.C.)
Ingleborough
Ivychurch
Holcsley
Nursery
Football Ground
Recreation Ground
School
Church House
Blakeley
Broadcoates House
Merton Ct.
Merton Hall
Merton Grange
Merton Grange Nursery
Merton Grange Cottages
Merton Grange Farm
Merton Grange Dairy
Merton Grange Stables
Merton Grange Coach House
Merton Grange Lodge
Merton Grange Gardens
Merton Grange Orchard
Merton Grange Paddock
Merton Grange Yard
Merton Grange Barn
Merton Grange Granary
Merton Grange Cowshed
Merton Grange Pigsty
Merton Grange Hayloft
Merton Grange Stable

PARK PREWETT MENTAL HOSPITAL
(Hants. Joint Mental Hospitals Committee)
Pumping Station
Nurses Home
PARK PREWETT RAILWAY
The Spinney
Allot. Gdns.
Hazelwood
Isolation Hospital
Dinkleburg Camp
LEBURY
Soldier's Return (B.H.)
Oakridge Farm
Mount Tabor Certified Institution
School
Chapel
Lodge
Merton Farm
Sherborne House
Rests
St. Thomas' Lodge
SOUTH VIEW
Leather Works
Saw Mill
Rising Sun (P.H.)
Allotment Gardens
Shooter's Lodge
Reading 15 / Basingstoke 1 M.S
G.P.
Nonehill House
Bolton's Lodge
Common Road
Infirmary
Post
T WESTERN RAILWAY
SOUTHERN RAILWAY
Goods Shed
Engine Shed
Station
Sewage Pumping Station & Refuse Destructor (Basingstoke Corpn.)
Vince's Farm
Basingstoke Canal (Disused)
River Loddon
Eastrop Bridge
Eastrop Farm
Timber Yd
Rectory
St Michael's Church
Pumping Station (Basingstoke Corpn.)
Rain Gauge
Mission Room
Public Swimming Bath
School
King George's Playing Field
Mission Hall
Queen's Grammar School
Motor Works
Highgate House
M.S Andover 18 / Allotment Gardens
West Ham Farm
West Ham House
Sports Field
Football Ground
Lodge
CEMETERY
Nurseries
Winchester Road Nurseries
King's Furlongs
South Ham Farm
The Mount
Allot. Gdns.
May's Bounty (Cricket Ground)
Pavilion
Vestry Hall
Girls' High School
BASINGSTOKE
BASINGSTOKE COMMON
WAR MEMORIAL PARK
Band Stand
Watercress Beds
Black Dam
Ratstall Hill
Basingstoke Bye-Pass
LON. 1° 7' W.
62
63
64
1° 6'
1° 5'
From Winchester
XVIII. S.E.
BASINGSTOKE MUNL. BORO.
BASINGSTOKE PH.
Scale — Six Inches to One Statute Mile or 880 Feet to One Inch = 1/10560
...d in 1930 Boundaries Revised to 1932.

Ordnance Survey
1938
Scale
1:10560

CHERTSEY UNION
HORSELL P.H.

BASINGSTOKE CANAL

From Farnham
LAT. 51° 19′

LONDON & SOUTH WESTERN RAILWAY

WOKING P.H.

WOKING U.D.

XVI. S.E.

30"

LAT. 51° 18′

WESTFIELD COMMON

WOKING

Vicarage

The Pines

St. Peter's Home (Convalescent)

Allotments

Pavilion

Football Ground

Nurseries

Maybury Inn

Shey Copse

The Rough

Pyrford Rough

Pyrford Court

Pyrford Stone

Stone Farm

Fox Hill

Spring

The Hanger

Church Farm

Union C.U.D. by

Friars Rise

Barrens

Dennington

Ashwood

Recreation Ground

Swimming Bath

Nursery

Whitegrass Farm

Highlands

Roundhill Farm

Monument Hill

Roundbridge Farm

Windpump

Gravel Pit

Hoe Place

Hoe Bridge

Hoe Ridge Farm

Sewage Farm (Woking U.D.C.)

Sewage Works (Woking U.D.C.) Tanks

Filter Beds

Filter

Contact Bed

Liable to Floods

RIVER WEY

Towing Path

Wokingpark Farm

Kingfield House

Kingfieldgreen

Shackleford

Old Woking

Poundfield House

The Grange

Oldhall Copse

Old Hall (Remains of)

Chap

Vicarage

Pound

Hipley Bridge

Mill Moor

Broadmead Bridge

St. Peter's Church

Boat Houses

Papercourt Lock

Papercourt Farm

School

Infant School

St. Martha Printing Works

U.D. By

Elm Bridge

Kingfield Green

Hole

Ch.

Sch.

Liable to F